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July 20, 2012

VIA FEDERAL EXPRESS AND ELECTRONIC MAIL

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RE: Request for Partial Reconsideration and Stay of EPA's Final Rule titled "Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards," 77 Fed. Reg. 30,088 (May 21, 2012) (Docket No. EPA–HQ–OAR–2008–0476), as it applies to Wise County, Texas

Dear Administrator Jackson, Regional Administrator Coleman and Associate General Counsel McLean:

I am writing on behalf of Devon Energy Corporation ("Devon") to respectfully request that the U.S. Environmental Protection Agency ("EPA") grant partial reconsideration and immediately stay the effective date and implementation of EPA's Final Rule titled "Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards," 77 Fed. Reg. 30,088 (May 21, 2012) (the "Rule") as it applies to Wise County, Texas.

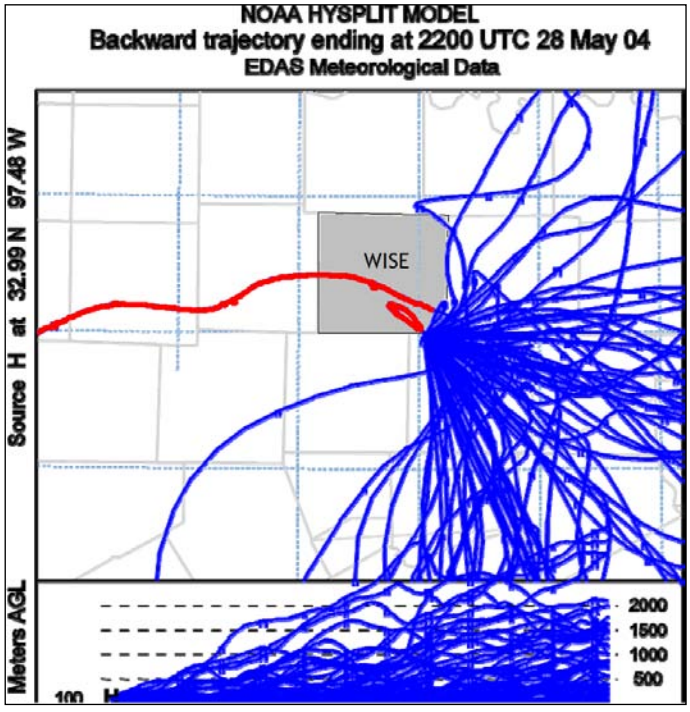
As discussed below, EPA should reconsider the designation of Wise County as being in nonattainment with the 2008 8-hour ozone National Ambient Air Quality Standard ("NAAQS"). The Agency's final decision is not supported by sound science, does not have a rational basis in the record, relies on methodologies that are a departure from and not a logical outgrowth of the proposal, and is otherwise arbitrary. In brief, reconsideration is warranted for the following reasons:

- At the outset, we urge the Agency to reconsider the Wise County, Texas, nonattainment designation anew now that EPA has made fundamental changes to the leadership of Region 6, which had primary responsibility for the designation recommendation. The record demonstrates that former EPA Region 6 Administrator Dr. Al Armendariz was the decision maker who recommended designating Wise County as being in nonattainment. As the Agency is aware, Dr. Armendariz resigned just one day prior to EPA Headquarters adopting his recommendation in the final Rule. We do not intend this document to be a rehashing of the controversy surrounding Dr. Armendariz's departure. However, based on information that became available after the comment period closed, along with his publications from before he became Regional Administrator, we have serious concerns that Dr. Armendariz did not bring the spirit of pure objectivity and lack of bias that is the sought-after hallmark of good government and defensible agency action. Given the direct involvement of Dr. Armendariz in this decision, his public positions regarding oil and gas development in the Barnett Shale generally and in Wise County in particular, and the fact that Dr. Armendariz's views regarding the treatment of the oil and gas industry were not fully disclosed during the comment period, we urge EPA to reconsider and stay the Wise County decision so that the Agency can make a decision free from any shadow of bias. Should EPA grant reconsideration, Devon commits to support EPA's and the Region's efforts on reconsideration as a key stakeholder in any public comment period and in assisting the Agency in its analysis in any other appropriate manner.

- Against the Region 6 decision making environment background that existed as the Wise County matter was being considered, there are very significant additional reasons that EPA must grant reconsideration here. First, EPA in the final Rule for the first time supported its decision in part with a faulty re-analysis of modeling submitted by TCEQ. This newly-released, and flawed, analysis relies on a heretofore undisclosed 1% standard for what the Region considers to be a contribution to ambient air quality, a standard which the Agency does not use in other Regions. In the only other Region where EPA arguably comes close to using a similar methodology, that Region applies a significantly distinct standard that sets a threshold for contributions up to two and a half times higher than EPA applied for Wise County. Additionally, in calculating and applying this standard, EPA relies on modeling that is inconsistent with its past practice and guidance documents. This disparate treatment leads to an arbitrary decision for Wise County that would have been different in any other EPA Region, and EPA's new faulty analysis—which was not part of the proposed rule and public comment process—warrants reconsideration.

- Second, EPA Region 6, in a departure from other EPA Regions, relied inappropriately on a model known as HYSPLIT to justify the ozone nonattainment designation for Wise County. However, as other EPA Regions have recognized, HYSPLIT cannot establish a causal connection between winds in one area and ozone formation in another—a critical link in the decision on whether an area is contributing to nonattainment. In numerous separate instances involving other EPA Regions in this same decision document, other Regions relied on prevailing wind patterns instead of the HYSPLIT model. This disparate treatment leads to an arbitrary decision for Wise County that would have been different had Wise County been in a Region that used the prevailing wind approach.

- Third, even applying the HYSPLIT model, EPA's decision is arbitrary. The HYSPLIT model found only *two days in four years* of data when wind from Wise County entered the Dallas/Fort Worth ("DFW") nonattainment area on high ozone days. On one of those days, the wind originated in a portion of the DFW nonattainment area and briefly looped through Wise County and re-entered the DFW nonattainment area. Thus, there is no rational and objective basis—even based on EPA's faulty modeling—to support the Wise County determination. Correlating those two days to the 83 NAAQS exceedance days that EPA modeled further demonstrates that Wise County does *not* contribute to nonattainment. Every one of the days that EPA modeled is represented by a line on the following chart from EPA, with the two days where modeling suggests that wind may have blown from Wise County represented in red. The remaining spaghetti bowl of blue lines are all of the days when the modeling concluded that wind did *not* blow from Wise County. Given the wind pattern in the area that is demonstrated by the HYSPLIT modeling, it was arbitrary and capricious to conclude that Wise County is contributing to nonattainment in an area where the wind from Wise County almost never blows.



- Finally, since the comment period on the Rule closed, TCEQ has determined that it needs to correct an important emission factor underpinning the emissions inventory that EPA relied upon for Wise County, the factor for emissions of volatile organic compounds ("VOCs") from condensate storage tanks at oil and gas operations. The pending correction is likely to result in a significantly lower estimate of emissions from Wise County, further undermining the basis for listing Wise County as being in nonattainment. Devon urges EPA at this time to reconsider and stay the determination, which would allow not only for the promise of unbiased decision making, but the opportunity to consider fully and fairly this corrected data before finalizing such a critical decision.

We respectfully do not make this request for reconsideration lightly, but urge the Agency to reconsider and stay its decision as to Wise County for the reasons articulated below, and because of the significant adverse impact the decision will have in the area in the interim. Headquartered in Oklahoma City, Devon is a leading independent oil and gas exploration and production company, and the largest producer in the Barnett Shale area. Many of Devon's production and midstream assets are located in Wise County, including gathering, transmission and a gas processing plant with a current capacity of 650 million cubic feet of natural gas per day, currently undergoing an expansion to 790 million cubic feet per day. Devon's operations are focused onshore in the United States and Canada. While we fully share and support the EPA's effort toward improved environmental quality in nonattainment areas, EPA's decision to include Wise County in the DFW nonattainment area is not justified and unfortunately will lead only to severe economic harms with minimal environmental benefits.

Devon estimates that the incorporation of Wise County into the DFW nonattainment area would impose significant compliance costs. Based on existing nonattainment rules for the DFW region, Devon's capital cost of compliance in the first year of a nonattainment regulatory program is estimated to be $18MM. These costs are from engine modifications, additional control equipment and increased rental cost for leased compression to limit emissions from Devon's compression fleet to 0.5 g NOx/hp-hr.

This nonattainment designation also puts Devon's exploration and production (E&P) business at significant risk in future years. Since there are few ozone precursor source types in Wise County, it is reasonable to expect that E&P minor source facilities would be included in an emission offset program in the event that Reasonable Further Progress toward ozone attainment cannot be demonstrated (as was the case in this region in 2011). A limited supply of offsets is available to support oil and gas development in Wise County because of the multiple state and federal air quality regulations that are already in effect. To date, Devon has identified approximately 1000 future drilling sites in Wise County. For every well that wouldn't be drilled because of offset limitations, lost net revenue is estimated to be approximately $17.2 million for each well not drilled. If Devon, for example, did not drill 25% of the remaining Wise County wells, the resultant decrease in revenue is estimated to be $4.3 billion. In addition, for each well not drilled in Wise County, an additional $2.95MM that Devon typically spends for outside services and supplies in Wise County would be lost.

This nonattainment designation is also likely to harm development of Barnett Shale, which currently provides an important source of natural gas to fuel industry and create jobs.

Through Devon's pioneering effort, the Barnett Shale has emerged as the largest natural gas field in Texas. The north Texas play has potential to remain one of the country's most vital energy resources for many years to come. However, this potential is threatened by the designation of Wise County as being in nonattainment.

President Obama has recognized that natural gas fosters a multitude of benefits and should play an increasingly important part of our energy future, stating in an Executive Order that:

> [Natural gas] production creates jobs and provides economic benefits to the entire domestic production supply chain, as well as to chemical and other manufacturers, who benefit from lower feedstock and energy costs. By helping to power our transportation system, greater use of natural gas can also reduce our dependence on oil. And with appropriate safeguards, natural gas can provide a cleaner source of energy than other fossil fuels.[1]

In addition, EPA has already signaled the importance natural gas is likely to play in the future of energy production in the United States through its proposed New Source Performance Standards for greenhouse gas emissions from electric generating units, which if promulgated would compel the use of natural gas at most if not all new facilities. *See* Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, Docket ID No. EPA –HQ–OAR–2011–0660; FRL–9654–7, 77 Fed. Reg. 22,392 (Apr. 13, 2012). EPA should not take unwarranted actions that threaten development of this important resource.

The unnecessary impacts on jobs and the local and regional economies come at a time when the nation is working hard toward economic recovery and the promotion of gas as a critical and environmentally favorable alternative to coal. Unfortunately, EPA's decision regarding Wise County is likely to have a long lasting adverse impact given that when a county is identified as nonattainment, it has the potential to remain that way until the air quality of the entire nonattainment area returns to attainment, even if attainment is achieved earlier in that county. The growth in the DFW area may make achieving attainment for the entire area difficult and could even result in increasingly stringent emission control requirements for the area, further impeding economic activity. Here, there is no rational reason to impose such burdens on Wise County.

For all of these reasons, Devon urges EPA to reconsider the Rule and stay the effectiveness of the Rule as to Wise County pending reconsideration.

[1] Executive Order, *Supporting Safe and Responsible Development of Unconventional Domestic Natural Gas Resources* (Apr. 13, 2012).

I. Standards for reconsideration and stay

Section 307(d)(7)(B) of the Act provides for EPA's reconsideration of a Clean Air Act ("CAA") rule upon objection by a petitioner. *See* 42 U.S.C. § 7607(d)(7)(B). EPA *must* grant reconsideration when the petitioner:

> [C]an demonstrate to the Administrator that it was impracticable to raise [an] objection [during the period for public comment] or if the grounds for such objection arose after the period for public comment … and if such objection is of central relevance to the outcome of the rule.

Id. In such a situation, reconsideration is mandatory, as the CAA commands that EPA "*shall* convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed." *Id.* (emphasis added). Further, EPA is authorized to stay the effectiveness of rules promulgated under the CAA. *See id.* In addition, general principles of administrative law permit an interested party to apply to EPA for relief from a rule at any time for any relevant reason.

This Petition satisfies the standard for reconsideration for several reasons. First, as described below, the full scope of Dr. Armendariz's views and predisposition against oil and gas development—views which he clearly indicated he adopted into his official capacity as the chief federal environmental regulatory official for the EPA region that includes Texas—were not made public during the comment period; news reports detailing certain comments of relevance to this decision emerged in the week before Administrator Jackson signed the final Rule.

In addition, EPA included new—and flawed—modeling work as part of its final technical support document that was not made available during the comment period and that became the basis for critical conclusions on which EPA relied in supporting the nonattainment determination of Wise County. As part of that modeling, EPA—for the first time in the final Rule—also published and relied on a novel standard for what the Agency apparently considers "contribution" to ambient air quality for Wise County only.[2] That standard was not identified in the proposed rule and thus was not a possible topic for comment, nor does it appear to have been applied in any other EPA region. Commenters such as Devon thus could not have commented on this standard. In fact, by the standards applied in other EPA regions, Wise County would not have been listed in nonattainment. Thus, it was inappropriate and arbitrary for EPA in the final Rule to apply a disparate standard in Region 6 which purported to capture Wise County where other regions would not, and Devon was entitled to the opportunity to comment on such disparate treatment. Because the methodology EPA utilized in the final Rule was not a logical outgrowth of the proposal, and for the reasons stated below, EPA must grant reconsideration.

Finally, there is a new recognition by TCEQ that a crucial emission factor upon which EPA relied in the Wise County determination needs to be corrected, and the likely outcome of

[2] *See* EPA, *Dallas-Fort Worth, Texas Final Area Designations for the 2008 Ozone National Ambient Air Quality Standards* at 17-20 ("Final DFW TSD") (modeling to determine "the number of days an impact was over 1% (0.75 ppb) on a modeled exceedance of the 75 ppb standard and also model exceedances greater than 70 ppb").

that correction will be a significant reduction in estimated Wise County VOC emissions. Based on the Final DFW TSD, it is clear that EPA placed significant weight on the total estimated amount of VOC emissions in Wise County associated with Barnett Shale oil and gas production in making the nonattainment determination. Had the total estimated amount more accurately reflected actual VOC emissions from such operations, EPA may have concluded differently. This issue could not have been developed further during the comment period because TCEQ had not yet commenced working on a revised VOC emissions factor. Reconsideration is therefore necessary and an accompanying stay is warranted until TCEQ can complete and submit the revised VOC emissions factor, and EPA can consider it. *See* 42 U.S.C. § 7607(d)(7)(B).

In addition to the fundamental logical outgrowth flaws, EPA did not adequately justify or explain why it promulgated the specific regulations that it included in the final Rules, as it is required to do. *See* CAA § 307(d)(6)(A) ("The promulgated rule shall be accompanied by . . . (ii) an explanation of the reasons for any major changes in the promulgated rule from the proposed rule."); *see also Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (an agency must "articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made." (internal quotation omitted)). Further, the CAA requires EPA to provide "a response to each of the significant comments, criticisms, and new data submitted in written or oral presentations during the comment period." *See* CAA § 307(d)(6)(B). EPA's failures to provide adequate justification and explanations further justify reconsideration.

Pending reconsideration, the Administrator should stay the application of the Rule. Under the APA, "[w]hen an agency finds that justice so requires, it may postpone the effective date of action taken by it, pending judicial review." 5 U.S.C. § 705. EPA has applied this standard to Clean Air Act cases.[3] The standard for such an administrative stay is significantly different from the standard for a stay used by the courts because it does not require a demonstration of irreparable harm. This is clear from the text of the APA:

> When an agency finds that justice so requires, it may postpone the effective date of action taken by it, pending judicial review. On such conditions as may be required and to the extent necessary to prevent irreparable injury, the reviewing court . . . may issue all necessary and appropriate process to postpone the effective date of an agency action or to preserve status or rights pending conclusion of the review proceedings.

Thus, the APA deliberately contrasts what is required for an administrative stay—"justice so requires"—and a judicial stay—"conditions as may be required" and "irreparable harm." Similarly, CAA Section 307(d)(7)(B) authorizes an administrative stay, but does not premise that stay on a finding of irreparable injury. Such differences must be given effect,[4] so there is no

[3] *See, e.g., Ohio: Approval and Promulgation of Implementation Plans*, 46 Fed. Reg. 8,581, 8,582 n.1 (Jan. 27, 1981).

[4] "[W]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or

irreparable harm requirement for an administrative stay. Given the potential impact of these regulations on Devon and the surrounding economy that depends on the development of the Barnett Shale, "justice so requires" that EPA stay the Rules and take other necessary and appropriate steps to defer the compliance deadlines and other provisions of the Rules until the outcome of the reconsideration process. Even were a petitioner required to meet the factors for a judicial stay, Devon would do so here. As discussed below in Section III, Devon will be irreparably harmed if the Rule goes into effect and those harms will spread to others in Wise County and Texas. By comparison, there will be essentially no environmental impact if EPA stays the Rule while it conducts reconsideration.

II. Grounds for Reconsideration

A. EPA Should Decide the Attainment Status of Wise County Free from Any Shadow of Bias

It is only with significant regret and reluctance that Devon is compelled to urge EPA to reconsider the Wise County designation to remove the shadow of bias and lack of objectivity currently cast on the Agency's final decision. After the close of the comment period for EPA's re-designation of Wise County, Texas, and just days before Administrator Jackson signed the Rule, the public learned for the first time that then EPA Region 6 Administrator Armendariz, who had leadership and delegated responsibility for the re-designation, had made incendiary statements demonstrating bias in his regulatory approach against the Texas oil and gas industry. In particular, the media widely reported a video of Dr. Armendariz from 2010, in which he indicated his view that EPA should "crucify" oil and gas companies. Speaking to a group in Dish, Texas, Dr. Armendariz indicated that he would enforce the Clean Air Act against oil and gas companies "like how the Romans used to conquer little villages in the Mediterranean." Mike Sorahan, *Inhofe to Investigate EPA's Handling of Drilling Complaints*, Greenwire (Apr. 25, 2012).[5] He explained that the Romans would "go into a little Turkish town somewhere, they'd find the first five guys they saw and they would crucify them. And then you know that town was really easy to manage for the next few years." *Id.* Dr. Armendariz noted that EPA would "hit" oil and gas companies "as hard you can and you make examples out of them." *Id.*

These comments were made prior to his determination to change the attainment status of regarding Wise County, but were not disclosed to the public until after the comment period closed. Indeed, approximately a year after these inflammatory comments, but well before they became public, Dr. Armendariz personally notified the Governor of Texas that EPA would be taking the rare and extraordinary step of overruling the Governor's recommendations on air quality designations for ozone. In particular, Dr. Armendariz indicated that EPA intended to designate Wise County as nonattainment. *See* Letter from Al Armendariz to Governor Rick Perry (Dec. 9, 2011). Wise County has a relatively small population compared to most counties within the DFW nonattainment area, but it does have substantial oil and gas production as part of the development of the Barnett Shale, and this oil and gas production has increased in recent

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exclusion." *Russello v. United States*, 464 U.S. 16, 23 (1983) (quotation marks and citation omitted; alteration in original).

[5] *Available at* www.eenews.net/eenewspm/print/2012/04/25/2.

years. The presence of this oil and gas production appears to be a significant factor in EPA's decision to designate Wise County in nonattainment, as EPA emphasized the emissions from oil and gas production in Wise County in its Final DFW TSD supporting the designation of Wise County as nonattainment. *See id.* at 23.[6]

Furthermore, Dr. Armendariz has an extensive history of focus on and views related to the development of oil and gas production in the Barnett Shale. Indeed, Dr. Armendariz addressed these issues in a controversial report he authored in 2009 before joining EPA, which focused specifically on the emissions from oil and gas production in the Barnett Shale Area. *See* Al Armendariz, *Emissions from Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements* 3-4 (Jan. 26, 2009) ("Armendariz Report") (addressing the emissions from oil and gas production in Wise County, among others). TCEQ and others have criticized the report as being based on non-comparable data and exaggerating the relative significance of the emissions from the Barnett Shale with regard to ozone formation in the Dallas-Fort Worth area.[7]

During the comment period on EPA's re-designation, no interested party had a basis to appreciate the hostility toward the oil and gas industry that Dr. Armendariz's 2010 comments demonstrated and which he brought to his role as the chief federal environmental regulator in Texas. Only in April 2012 did interested parties learn of these views through media reports. As reported by the media, this newly discovered and extreme hostility toward oil and gas companies spurred Congress to investigate the handling of the oil and gas industry by Dr. Armendariz and EPA. *See* Sorahan, *infra*.

In the end, amid these strong allegations of bias in conducting his official duties, Dr. Armendariz resigned on April 29, 2012. *See* Mike Soraghan, *Embattled appointee resigns over 'crucify' comment*, Greenwire (Apr. 30, 2012).[8] Only one day after Dr. Armendariz's resignation, Administrator Jackson signed the Final Rule. 77 Fed. Reg. at 30,095 (noting Administrator Jackson's April 30, 2012 signature). Dr. Armendariz recently joined the Sierra Club in June in the midst of a continuing investigation by Congress. *See* Emily Foxhall, *Former EPA Official Al Armendariz Joining Sierra Club*, The Texas Tribune (June 29, 2012)[9]; *see also* Jeremy P. Jacobs, *Hill GOP pounces on report that Armendariz visited Sierra Club*, Greenwire (June 8, 2012).[10]

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[6] The final rule promulgated by EPA does not contain any detailed discussion of the basis for its designation of Wise County, Texas, as being in nonattainment with the 2008 8-hour ozone NAAQS. Instead, the technical support documents for each area appears to serve as the decision document for that area, combined with further explanations in EPA's Response to Significant Comments, Docket No. EPA-HQ-OAR-2008-0476 (Apr. 2012) ("RTC").

[7] *See* TCEQ, *Analysis of Emissions from Natural Gas Production in the Barnett Shale* (2009), available at http://www.bseec.org/sites/all/pdf/airquality/17.pdf.

[8] *Available at* www.eenews.net/Greenwire/print/2012/04/30/1.

[9] *Available at* http://www.texastribune.org/texas-environmental-news/environmental-problems-and-policies/armendariz-joins-sierra-club/.

[10] *Available at* http://www.eenews.net/EEDaily/2012/06/08/archive/6?terms=armendariz.

To be clear, Devon does not raise these points to further a political debate or extend an ongoing controversy for the Agency. At the same time, there can be no doubt that Dr. Armendariz's comments and actions, which were not apparent at the time of the comment period, raise fundamental issues regarding the objectivity of his recommendation on the nonattainment determination that must be fully considered by the Agency. Reconsideration of EPA's re-designation of Wise County as nonattainment is warranted because Dr. Armendariz's acknowledged bias against the oil and gas industry—which led to his resignation just days before the Administrator adopted his recommendation—has tainted this determination for the entire Agency. "Decisionmakers violate the Due Process Clause and must be disqualified when they act with an 'unalterably closed mind' and are 'unwilling or unable' to rationally consider arguments." *Air Transp. Ass'n of Am. v. Nat'l Mediation Bd.*, 663 F.3d 476, 487 (D.C. Cir. 2011). Dr. Armendariz's extraordinary comments about his approach to regulating oil and gas companies go beyond just personal views, but reveal a fundamental view as a regulator that indicates a closed mind and an inability to rationally consider the designation of Wise County, which involves the two areas that Dr. Armendariz explicitly criticized: growth of the oil and gas industry and the Barnett Shale. Indeed, the Final DFW TSD supporting EPA's Rule specifically notes the "high growth in [area] emissions is due in large part to growth in emissions from Barnett Shale gas production," *id.* at 23, and Dr. Armendariz in 2009 had already concluded that Wise County was one of the largest oil and gas producing county in the Barnett Shale area. Armendariz Report at 3. Dr. Armendariz's open hostility toward the oil and gas industry shows that he was "incapable of giving fair consideration to the" proper designation of Wise County. *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1179 (D.C. Cir. 1980). His prior views on oil and gas production in the Barnett Shale in combination with his hostility toward oil and gas companies appears to have infected his views on whether to designate Wise County as nonattainment.

This hostility toward oil and gas development in the Barnett Shale, and in Wise County in particular, is only affirmed by the puzzling lack of sound basis for listing Wise County in nonattainment and the disparate treatment by Region 6 compared to other regions. As demonstrated by comments and as discussed below, there was no rational basis for listing Wise County in nonattainment. The wind direction, the air modeling and the rest of the record all point to the conclusion that Wise County should not be listed in nonattainment. [11] Yet, under Dr. Armendariz's leadership, Region 6 led EPA to decide to list Wise County in nonattainment. The only demonstrable factors that distinguish Wise County from other similarly situated areas that were not designated as nonattainment are the oil and gas development in the county and Dr. Armendariz's longstanding concerns regarding such industry which predated his EPA tenure and explicitly continued into this particular rulemaking.

Dr. Armendariz's open and notorious hostility to the oil and gas industry cannot be dismissed as a mere discussion of policy, *see Ass'n of Nat'l Advertisers, Inc. v. FTC*, 627 F.2d

[11] Importantly, the very same flaws that plagued Dr. Armendariz's Report plague his recommendation to designate Wise County as nonattaintment—namely, they both rely on erroneous conclusions about the direction the wind blows and the possible impact of this area on smog in the Dallas-Fort Worth area. *See* Methodology of Barnett Shale Emissions Study Raises Concerns: Unrelated Data, Improper Assumptions Dramatically Overstate Findings. Contrary to the findings of the report and Rule, the wind from Wise County blows away from the DFW area almost all of the time. This further raises a shadow of bias that brought Dr. Armendariz's personal views into the official decision making process here.

1151, 1171 (D.C. Cir. 1979), nor can it be considered advocacy on an open legal question, *Gersman v. Grp. Health Ass'n*, 931 F.2d 1565 (D.C. Cir. 1991). Rather, it regrettably reveals a deep-seated animosity and a "single-minded commitment" toward disparate treatment of a particular industry that is prominent in Wise County. *Lead Indus.*, 647 F.2d at 1179. Now that EPA has taken action to replace Dr. Armendariz, we urge the Agency to take similar necessary action regarding a decision that is clearly cast in doubt as a result of his key involvement and the apparent injection of his personal bias into the official recommendation and decision. EPA should reconsider and stay the determination, and should it proceed through a further notice and comment process, Devon commits to assist the Agency in participating and providing information to make a decision that upholds the Agency's principles of "scientific integrity, rule of law and transparency," as described by Administrator Jackson on her first day leading the Agency.[12] As President Obama's January 2011 executive order makes clear, our regulations "must be based on the best available science," not personal bias, and "must take into account benefits and costs, both quantitative and qualitative."[13]

B. EPA Justified the Final Designation of Wise County as in Nonattainment Based on New, Flawed, and Inadequate Modeling

In designating Wise County to be in nonattainment, EPA relies upon section 107(d) of the Clean Air Act, pursuant to which EPA says it "must designate an area 'nonattainment' if it is violating the 2008 ozone NAAQS or if it is contributing to a violation of the 2008 ozone NAAQS in a nearby area." Final DFW TSD at 1. Since Wise County does not contain any ozone monitoring sites, it necessarily is not violating the 2008 ozone NAAQS and would otherwise be "attainment/unclassifiable." Thus, EPA was required to demonstrate that emissions from Wise County contributed to a violation of the 2008 ozone NAAQS in a nearby area in order to include it within the DFW ozone nonattainment area ("NAA").

In the Final DFW TSD, EPA presents technical arguments using a five factor analysis and concludes that Wise County should be included in the DFW ozone NAA. However, EPA utterly fails to demonstrate that Wise County is violating or contributing to a violation of the 2008 ozone NAAQS in the DFW NAA.

EPA used two approaches in an attempt to link emissions from Wise County to a violation of the 2008 ozone NAAQS in a nearby area: (1) ozone source apportionment modeling performed by TCEQ where EPA analyzed the ozone contribution of Wise County emissions to daily maximum 8-hour ozone concentrations at monitoring sites on high ozone days; and (2) HYSPLIT back trajectories to the locations of monitoring sites on days that exceed the 2008 ozone NAAQS during 2006-2010.[14] Neither model demonstrates that Wise County is

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[12] Administrator Lisa P. Jackson, *Opening Memo to EPA Employees* (Jan. 23, 2009), available at http://blog.epa.gov/administrator/2009/01/26/opening-memo-to-epa-employees/.

[13] Executive Order, Improving Regulation and Regulatory Review (Regulatory Review Order) (Jan 18, 2011), available at http://www.whitehouse.gov/the-press-office/2011/01/18/improving-regulation-and-regulatory-review-executive-order.

[14] EPA focused on the Wise County contributions to ozone concentrations at three monitoring sites, the Keller ("KELC") and Eagle Mountain Lake ("EMTL") monitors in Tarrant County and a monitor in Parker County. The 2008-2010 8-hour ozone Design Values at KELC and EMTL were 0.086 and 0.085 ppm, respectively, so they

contributing to a violation of the 2008 ozone NAAQS such that the county should be listed as being in nonattainment.

1. EPA's newly released, and flawed, analysis of TCEQ's ozone source apportionment modeling does not demonstrate that Wise County is contributing to violations of the 2008 ozone NAAQS

In order to support its conclusion that Wise County should be listed as being in nonattainment, EPA for the first time in the final Rule deconstructed and reanalyzed source apportionment modeling provided to EPA by TCEQ. *See* Final DFW TSD at 15-20. TCEQ submitted the ozone source apportionment modeling and indicated that its modeling demonstrated that Wise County should not be listed in nonattainment. However, EPA in the final Rule relied heavily on its own re-analysis of TCEQ's modeling in order to reach its decision to list Wise County in nonattainment. In its "Conclusion" section of the Final DFW TSD, EPA added a conclusion to the Wise County discussion that is based completely on this analysis. *Id.* at 23 ("Source apportionment modeling for a portion of an ozone season indicates that emissions from Wise County can contribute to observed violations in the DFW nonattainment area."). EPA's analysis is both faulty and not a logical outgrowth of the proposal, requiring that the public have an opportunity to comment on such analysis prior to EPA's incorporation of such analysis into a final Rule.

As background, the following is a brief summary of EPA's analysis:

- EPA analyzed TCEQ's ozone source apportionment modeling that used the CAMx model and its Anthropogenic Precursor Culpability Assessment ("APCA") ozone source apportionment tool to estimate the ozone contributions due to Wise County at ozone monitoring sites on days the modeled concentrations exceeded the ozone NAAQS (ozone > 75 ppb).

- EPA also looked at the CAMx/APCA contributions of emissions from Wise County emissions when ozone was greater than 70 ppb, based on EPA's concern that the model under predicts the observed maximum ozone concentrations.

- In addition to looking at Wise County's maximum and average contribution on high ozone days, EPA also determined the number of days the Wise County ozone contributions exceeded 1 percent of the NAAQS (0.75 ppb).

- EPA found 6 monitor-days when CAMx/APCA Wise County ozone source apportionment exceeded the 0.75 ppb threshold during modeled exceedance conditions with no one monitor having more than one day.

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violated the 8-hour ozone NAAQS. However, the 2008-2010 8-hour ozone Design Value for the Parker County monitor was 0.075 ppm, which is within the 8-hour ozone NAAQS. Thus, as EPA recognized, Wise County's contribution to ozone at the Parker County monitoring site is unimportant in this exercise since it is not violating the March 2008 ozone NAAQS.

There are several fundamental flaws and legal deficiencies with EPA's approach in the final Rule, as discussed below.

a. **Because commenters did not have an opportunity to review and critique this flawed analysis, which EPA relied upon for its conclusion, EPA should grant reconsideration**

As a fundamental matter, EPA's new analysis of TCEQ's modeling was not made available for comment. It was only made available as part of the Final DFW TSD. It was therefore impracticable for Devon to raise objections to the modeling work and the standard for "contribution" during the public comment period. Given the significant problems with EPA's analysis highlighted below, and the potential that further errors will be discovered as the work is examined, reconsideration is absolutely necessary. *See* 42 U.S.C. § 7607(d)(7)(B).

EPA's inclusion of significant new issues in support of the final Rule is arbitrary and capricious because the new analysis is not a "logical outgrowth" of the Agency's proposed rule. *Envtl. Integrity Project v. EPA*, 425 F.3d 992, 996 (D.C. Cir. 2005) (stating that "[t]he test is whether a new round of notice and comment would provide the first opportunity for interested parties to offer comments that could persuade the agency to modify its rule"). A "final rule is a 'logical outgrowth' of a proposed rule only if interested parties should have anticipated that the change was possible, and thus reasonably should have filed their comments on the subject during the notice-and-comment period." *Id.* (citations omitted). This rule exists because the public "must be able to trust an agency's representations about which particular aspects of its proposal are up for consideration." *Id.* at 998. Because EPA relied on an entirely new—and flawed—basis for listing Wise County in nonattainment, which commenters were not able to review or critique, EPA must grant reconsideration and stay implementation of the Rule. As the following discussion demonstrates, there are important flaws in EPA's new analysis and it does not follow the Agency's past practice or guidance.

a. **The modeling assumed significantly higher emissions from Wise County than EPA has since recognized exist**

EPA's analysis of the TCEQ modeling failed to recognize an important limitation of the original TCEQ work. As TCEQ highlighted when describing its modeling, "TCEQ did not use the updated oil and gas sector pneumatic emissions submitted October 2011 to the EPA for the Periodic Emissions Inventory in this modeling and source apportionment analysis, therefore, the VOC emissions from this source category are likely overestimated in the modeling."[15]

As EPA recognized, the updated oil and gas sector pneumatic emissions reflect better data than what EPA had used to support the proposal. RTC at 55-56. Further that data reflects significantly reduced emissions from Wise County. The revised emission inventory for Wise County is 25% lower—reducing the VOC emissions in Wise County by 6,048 tpy, from 23,657 tpy to 17,609 tpy.

[15] Comments submitted by Mark Vickery, Executive Director, TCEQ at 10 (EPA–OAR–HQ–2008–0476-0296).

Despite the fact that EPA *accepted* the fact that VOC emissions from Wise County are likely at least 25% lower than those used in the TCEQ modeling, the Agency failed to *use* that information. Given that EPA obtained the modeling files from TCEQ and redid some of the analysis for its own purposes (Final DFW TSD at 15-20), it clearly had the capability to utilize the newer VOC data. It's failure to do so was arbitrary and capricious. Thus, the Agency should reconsider its reliance on modeling results that likely overstate the impact of Wise County.

b. EPA's analysis establishes a new, and heretofore undisclosed, 1% standard for what the Region considers to be contribution

In reanalyzing the TCEQ modeling, EPA in the final Rule for the first time established a threshold for what the Region considered significant enough to warrant concluding that a county is contributing to a violation. Specifically, EPA "used a 1% of the standard cut point for days where [the Agency] would consider … Wise County's impact to be significant." Final DFW TSD at 17. Thus, EPA looked for the "number of days an impact was over 1% (0.75 ppb) on a modeled exceedance." *Id.*

EPA had not proposed or used this 1% standard before for the DFW nonattainment area. EPA in the final Rule simply selected that standard from out of thin air and did not offer a rational basis for its use. Such an unjustified selection is arbitrary and capricious and warrants reconsideration. Further, other EPA regions have not applied such a 1% standard. As the D.C. Circuit has held, EPA cannot adopt arbitrary approaches across its regions, but must apply consistent standards across the Agency. "[The] County's nonattainment designation is troubling because of the apparent inconsistency in EPA's approach to designations in different EPA regions." *Catawba County v. EPA*, 571 F.3d 20, 51-52 (D.C. Cir. 2009).

c. EPA's reliance on the 1% standard is inconsistent with its conclusions for the Chicago area

Even more troubling than the fact that EPA did not disclose or use the 1% standard elsewhere, is the fact that the 1% standard (0.75 ppb) is much lower than the levels that EPA applied to other counties. EPA said it considers 2-4 ppb ozone contributions to be levels warranting designation as nonattainment for two counties that EPA concluded were contributing to nonattainment in the Chicago area (Lake and Porter counties).[16] Those levels are 267% to 533% higher than the 0.75 ppb level that EPA points to for the DFW area.

In fact, it appears that if Wise County were in the Chicago area, for example, it would not have been listed as being in nonattainment. EPA concluded that Jasper County, which EPA determined to be contributing 0.5 ppb should not be considered to be contributing to nonattainment. The primary driver for the decision not to list Jasper County is that EPA did not

[16] EPA, *Chicago-Naperville, Illinois-Indiana-Wisconsin Area Designation for the 2008 Ozone National Ambient Air Quality Standards* at 18 ("In keeping with EPA's ozone contribution levels used to select states that should be covered in regional emission control programs, 2 ppb to 4 ppb ozone concentration contributions are considered to be significant ozone contributions.").

consider a 0.5 ppb contribution significant enough to warrant listing.[17] At that level, EPA "concluded that emissions from Jasper County do not meaningfully contribute to the high ozone concentrations at the Zion monitor."[18] By comparison, EPA calculated a maximum Wise County contribution of 0.86 ppb to the Eagle Mountain Monitor. That contribution is far more consistent with the 0.5 ppb contribution from Jasper County (*not* listed in nonattainment) than it is for the 2-4 ppb contributions from Lake and Porter counties (listed as in nonattainment). As the D.C. Circuit has made clear, "[s]uch inconsistent treatment is the hallmark of arbitrary agency action." *Catawba County*, 571 F.3d at 51-52. Regardless of whether EPA set a benchmark at 0.5 ppb, 0.75 ppb, or 2-4 ppb, EPA was obligated to make this information available for notice and comment. EPA has not done so. Every one of those potential standards was first raised in EPA's final technical support documents. Given the centrality of the issue—and the fact that EPA did not take this approach in any other region—reconsideration is warranted. *See* 42 U.S.C. § 7607(d)(7)(B).

d. EPA's calculations for the 1% standard are flawed and do not represent contributions to NAAQS violations

A central flaw in EPA's analysis is that it confuses exceedances of the NAAQS with violations of the NAAQS. An exceedance of the 2008 ozone NAAQS is when ozone exceeds the 75 ppb standard. A violation of the 2008 ozone NAAQS occurs when an observed 8-hour ozone Design Value is above 0.075 ppm (i.e., 76 ppb or higher). The 8-hour ozone Design Value is defined as the three-year average of the fourth highest daily maximum 8-hour ozone concentration at a monitor.[19] The determination of nonattainment areas for the 2008 ozone NAAQS was based on ozone Design Values using measured air quality from the 2008-2010 three year period. Thus, to show Wise County contributes to a violation of the 2008 ozone NAAQS then its contributions to 8-hour ozone Design Values needs to be evaluated at monitors where the 8-hour ozone Design Values are above the ozone NAAQS, which was not done in EPA's DFW ozone NAA determination.

Rather than focusing on determining whether Wise County is contributing to violations of the NAAQS, EPA's analysis of TCEQ's modeling focused on daily contributions to ozone exceedances. As EPA explained, it "determined the number of days an impact was over 1% (0.75 ppb) on a modeled exceedance of the 75 ppb standard and also model exceedances greater

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[17] EPA, *Chicago-Naperville, Illinois-Indiana-Wisconsin Area Designation for the 2008 Ozone National Ambient Air Quality Standards* at 21 ("Jasper County contributes 0.5 ppb to the Zion monitor. …. It is concluded that emissions from Jasper County do not meaningfully contribute to the high ozone concentrations at the Zion monitor."). *See also* EPA, *Addendum to Responses to Significant Comments on the State and Tribal Designation Recommendations for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) for Section 3.2.5.1. Chicago-Naperville, IL-IN-WI area* at 10-11 ("[T]he ozone contribution potential of Jasper County, Indiana is relatively small, on the order of 0.0005 ppm (0.5 ppb) or less, supporting the exclusion of Jasper County from the Chicago-Naperville, IL-IN-WI ozone nonattainment area for the 2008 ozone NAAQS.")

[18] EPA, *Chicago-Naperville, Illinois-Indiana-Wisconsin Area Designation for the 2008 Ozone National Ambient Air Quality Standards* at 21 ("Jasper County contributes 0.5 ppb to the Zion monitor. …. It is concluded that emissions from Jasper County do not meaningfully contribute to the high ozone concentrations at the Zion monitor.").

[19] http://www.epa.gov/air/criteria.html.

than 70 ppb." Final DFW TSD at 17. EPA then looked at how many times Wise County had an impact of more than 0.75 ppb on DFW. *Id.* at 18. This analysis does not provide an answer to EPA's question of whether Wise County "is contributing to a violation of the 2008 ozone NAAQS in a nearby area." *Id.* at 1. In fact, as discussed Section II.B.2, the exceedance days that EPA identified where wind from Wise County may have reached the Eagle Mountain monitor are ones where the exceedance was modest. They are not the days that were used to determine whether there was a violation.

e. **EPA's approach of focusing on exceedances rather than violations is inconsistent with past Agency practice.**

For the Cross State Air Pollution Rule (CSAPR[20]) EPA had a similar issue to address, which was how to determine when an upwind state has a significant contribution to downwind ozone nonattainment. For CSAPR, EPA calculated the contribution of a state's anthropogenic emissions to 8-hour ozone Design Values using the same CAMx/APCA ozone source apportionment tool as used in the DFW nonattainment area determination. If a state's contribution to a downwind state's 8-hour ozone Design Value that violated the NAAQS exceeded 1 percent of the NAAQS (0.75 ppb), then the state was determined to have a significant contribution and was subject to the ozone seasonal NOx control requirements of CSAPR.

Unlike for CSAPR, which examined impacts on the 8-hour ozone Design Values that define whether an area is *violating* the ozone NAAQS, for the DFW nonattainment area determination, EPA looked at modeled *exceedance* days. This distinction matters because of the form of the ozone NAAQS—in which a monitoring site is allowed to have exceedances of the NAAQS without causing a violation—and the need for EPA to demonstrate that Wise County contributes to a violation of the ozone NAAQS in a nearby area. As discussed below, the distinction also matters in this case because the Wise County contribution to the 8-hour ozone Design Value is far lower than the Wise County's contribution to a few individual exceedances.

EPA's methodology is also inconsistent with past Agency practice because it is focused on absolute, rather than relative, results. The values that EPA reported in tables 13 and 14 of the Final DFW TSD are absolute results from the model and these are the results that EPA based its conclusions on. By comparison, when the TCEQ staff analyzed their CAMx/APCA source apportionment modeling results for Wise County, they used the model in a relative sense to scale the observed ozone Design Values. TCEQ calculated projected 2012 8-hour ozone Design Values with and without the CAMx/APCA contribution of emissions from Wise County at each monitoring site in the DFW area.

TCEQ's approach is the one recommended in EPA's modeling guidance for how to project ozone Design Values (EPA, 2007[21]). EPA modeling guidance recommends that the model be used in a relative, rather than absolute, sense (EPA, 2007, p. 18) to scale the observed ozone Design Values to obtain a projected ozone Design Value. EPA states that using the model in a relative sense is more reliable than using the absolute model results since it anchors the

[20] http://www.epa.gov/airtransport/.

[21] http://www.epa.gov/ttn/scram/guidance/guide/final-03-pm-rh-guidance.pdf.

future ozone projections to the observations (reality) and reduces the uncertainty in the calculations.

TCEQ's approach is also consistent with the approach used by EPA for CSAPR. In CSAPR, EPA estimated projected 2012 ozone Design Values due to all sources and then with a state's ozone contribution removed. The difference was the state's ozone contributions to the 8-hour ozone Design Value with the contribution determined to be significant if it was greater than or equal to 1 percent of the 1997 ozone NAAQS (0.85 ppb or higher). However, when tasked with a similar exercise for Wise County, EPA decided to not follow its own modeling guidance and previous procedures developed for CSAPR and they performed a completely different analysis that examines daily contributions to ozone exceedances, which does not show a contribution to a violation of the NAAQS.

Given that EPA's approach is inconsistent with its own guidance and past practice, whereas TCEQ's approach is consistent with both, EPA should grant reconsideration and rely on TCEQ's results.[22] TCEQ originally reported its contributions to the 2012 future design value as percentages (TCEQ Comments, Table 3), showing that Wise County only contributed roughly half a percent (0.53%) to the Eagle Mountain Lake monitor (M. Vickery, 2012[23]). That result alone demonstrates that Wise County's contribution is not sufficient to list the county in nonattainment, a conclusion which is reinforced when the contribution is estimated in parts per billion.

TCEQ's results, as reported in parts per billion, demonstrate that the county should not be listed in nonattainment. Using projected 2012 8-hour ozone Design Values of 78.06 and 76.05 ppb from the DFW ozone SIP for the Eagle Mountain Lake ("EMTL") and Keller ("KELC") monitors, respectively, we find that Wise County contributes 0.41 and 0.008 ppb to the projected 2012 8-hour ozone Design Values at the two monitoring sites. *See* Table 1 below.

The 0.41 ppb contribution from Wise County is far below any threshold that EPA has previously used. It is well below the 0.75 ppb threshold referenced by EPA in the Final DFW TSD. It is similarly below the same 0.85 ppb threshold used in CSAPR. Further, it is well below the 2-4 ppb threshold that EPA used in the Chicago technical support document. Finally, it is even below the 0.5 ppb threshold for Jasper County that EPA, a level at which EPA determined emissions "do not meaningfully contribute to the high ozone concentrations at the [nearby] monitor.[24] Thus, Wise County does not contribute significantly to a violation of the 2008 ozone NAAQS in a nearby area.

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[22] Since EPA should have used the model in a relative, rather than an absolute, sense, EPA's concern about TCEQ having used the average of the predicted ozone levels in the grid cells around the monitor, rather than the maximum, should make very little difference. The relative difference between the maximum levels should not be significantly different than the difference between the average levels.

[23] Technical Analysis Support Documentation by the Texas Commission on Environmental Quality (TCEQ) Regarding U.S. Environmental Protection Agency (EPA) Responses to State and tribal 2008 Ozone Designation Recommendations (with cover letter from Mark. Vickery, Executive Director, TCEQ, January 11, 2012).

[24] EPA, *Chicago-Naperville, Illinois-Indiana-Wisconsin Area Designation for the 2008 Ozone National Ambient Air Quality Standards* at 21.

Table 1. Wise and Hood Counties contributions to projected 2012 8-hour ozone Design Values using TCEQ's CAMx/APCA ozone source apportionment modeling results.

Source Region	EMTL DV Contribution	KELC DV Contribution
Hood County[1]	0.08%	0.01%
Wise County[1]	0.53%	0.01%
DFW+Other[1]	76.52%	78.04%
IC/BC[1]	22.86%	21.93%
APCA DVF[1]	100%	100%
DFW SIP 2012 DVF[2]	78.06 ppb	76.45 ppb
Hood County	0.06 ppb	0.008 ppb
Wise County	0.41 ppb	0.008 ppb
DFW+Other	59.73 ppb	45.66 ppb
IC/BC	17.84 ppb	16.77 ppb

1. Technical Analysis Support Documentation by the Texas Commission on Environmental Quality (TCEQ) Regarding U.S. Environmental Protection Agency (EPA) Responses to State and tribal 2008 Ozone Designation Recommendations (M. Vickery, TCEQ, January 11, 2012).

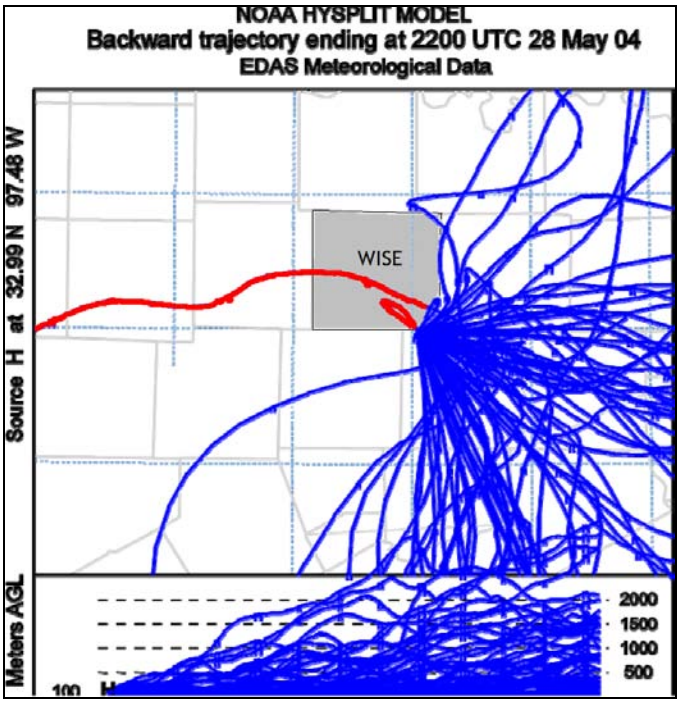
2. DFW Ozone SIP Table 6-4 page C-126 (http://www.tceq.texas.gov/assets/public/implementation/air/sip/dfw/ad_2011/AppC_CAMx_ado.pdf).

2. EPA's HYSPLIT modeling supports the conclusion that Wise County is *not* contributing to a violation of the 2008 ozone NAAQS

EPA fundamentally erred in both applying the HYSPLIT model and relying on results which demonstrate the precise contrary of EPA's conclusion: that Wise County is *not* contributing to a violation of the 2008 ozone NAAQS. First, HYSPLIT modeling provides no information regarding the actual formation or transport of ozone, so it is a tool of limited, if any, usefulness for determining ozone contribution. Second, EPA's HYSPLIT modeling results show that it is only in the rarest of instances that wind from Wise County actually reaches a monitor exceeding the NAAQS threshold. Thus, there was—and remains—no basis for EPA to conclude that Wise County is contributing to violations of the 2008 ozone NAAQS.

At the outset, HYSPLIT is fundamentally incapable of providing any kind of assessment of the ozone contribution due to emissions from Wise County. EPA used the HYSPLIT model to perform 24-hour back trajectory analysis from the locations of the KELC and EMTL monitoring sites on every observed ozone exceedance day (i.e., ozone $\geq$ 0.076 ppm) from the five year period of 2006-2010. As run by EPA, the HYSPLIT model follows the path of a particle or parcel of air starting above an ozone monitoring site backwards in time over 24-hours. The particle or parcel path does not account for dispersion or chemical transformation that is necessary to estimate ozone concentrations. It therefore cannot be used to determine causation, i.e., that any particular "particle" or "parcel" of ozone contributed to nonattainment in a downwind receptor. It just provides an ambiguous and uncertain indication of the general areas that were upwind of a monitoring site on days with ozone exceedances. Put differently, the HYSPLIT modeling just shows where the wind may be blowing from and provides no information regarding whether that wind is carrying ozone or any ozone precursors.

EPA notes in the DFW ozone NAA determination that the ozone exceedance day HYSPLIT back trajectories indicate that air transported from Wise County reaches the area of the EMTL monitor. However, the actual data presented by EPA indicate otherwise. The figure below is based on Figure 5a from EPA's DFW ozone NAA determination document. Figure 5a indicates ozone air parcels that arrived at the EMTL monitor during ozone exceedance conditions originated to the east to southeast of the EMTL monitor in the opposite direction of Wise County. Of the 83 back trajectories, only one appears to pass through Wise County. A second path blows from the area exceeding the NAAQS threshold, briefly passes over Wise County and then loops back and returns to the exceeding area. Rather than suggesting that Wise County contributes to violations of the 2008 8-hour ozone NAAQS at the EMTL monitoring, EPA's Figure 5a indicates that the wind may have blown over Wise County once in five years when there was an exceedance, but all other exceedances occurred when winds were blowing in the opposite direction from Wise County. Given that, the best interpretation of EPA's HYSPLIT modeling results is that Wise County is not contributing to a violation of the NAAQS.



Finally, the two days in which the HYSPLIT modeling indicates that wind passing over Wise County may have reached the monitor are days with minimal exceedances of the standard, not days that are used to calculate the violations of the ozone NAAQS. Table 2 lists the observed daily maximum 8-hour ozone concentrations at the EMTL monitoring site for the 83 days during 2006-2010 that exceeded the March 2008 ozone NAAQS. These are the days that EPA calculated HYSPLIT back trajectories as shown in Figure 5a of their DFW final NAA designations. The highest four daily maximum 8-hour ozone concentrations are highlighted in solid yellow. These top four exceedance days of each year are used to calculate the 8-hour ozone Design Value for the EMTL monitoring site that is used to determine whether the EMTL monitoring site violates the March 2008 ozone NAAQS. The three days that are identified as potentially representing the two back trajectories that intercept any part of Wise County (9/01/06,

7/31/08 and 9/29/08)[25] are highlighted with diagonal shading in Table 2 and tend to be on the lower end of the concentration distribution. Table 2 shows that not only is it a rare occurrence that a back trajectory from the EMTL monitor on an exceedance day would intersect with Wise County, but when such an unusual event does occur, it occurs on an exceedance day that is so low that it is not used in the calculation of the EMTL ozone Design Value that determines whether the monitor is violating the ozone NAAQS.

Table 2. Days during 2006-2008 that exceed the March 2008 ozone NAAQS at the EMTL monitoring site used in EPA's HYSPLIT back trajectory analysis with days used in the calculation of the 8-hour ozone Design Values highlighted in solid yellow and days with back trajectories that potentially[26] intersected with Wise County highlighted with diagonal shading.

2006 Date	8-Hour Ozone	2007 Date	8-Hour Ozone	2008 Date	8-Hour Ozone	2009 Date	8-Hour Ozone	2010 Date	8-Hour Ozone
20060614	107	20070814	121	20080804	98	20090625	100	20100604	94
20060609	106	20070815	101	20080618	92	20090605	92	20100827	91
20060628	98	20071004	86	20080623	86	20090626	92	20100828	83
20060718	98	20070725	84	20080619	85	20090826	92	20100529	81
20060612	95	20070922	84	20080722	81	20090702	91	20100917	81
20060618	92	20070812	81	20080808	80	20090813	89	20100826	80
20060719	92	20070920	80	20080826	80	20090806	84	20100811	78
20060630	88	20070921	80	20080907	80	20090627	82		
20060818	88	20070923	79	20080701	79	20090707	82		
20060720	87	20071012	79	20080814	78	20090903	80		
20060821	87	20070724	78	20080928	78	20090520	79		
20060615	86	20070827	78	20080731	77	20090521	77		
20060629	85			20080920	77	20090717	77		
20060707	85			20080929	77	20090823	77		
20060603	84			20080927	76	20090906	77		
20060608	84					20090519	76		
20060721	84					20090701	76		
20060831	83					20090822	76		
20060613	82								
20060708	82								
20060914	82								
20060901	81								
20060907	81								
20060724	80								
20060908	80								
20060701	78								
20060819	78								
20060610	77								
20061008	77								
20060605	76								

[25] As discussed in Texas Pipeline Association's comments at 33, it was not possible to identify which of two days correlated to one of the back trajectories passing over Wise County. Thus, the two possible days are included in this analysis. The result is that three days are examined above, whereas there were actually only two relevant back trajectories.

[26] As discussed in the previous footnote, three days are examined above, whereas there were actually only two relevant back trajectories.

C. **EPA must reconsider the Rule because new data demonstrates emissions from condensate storage tanks are likely much lower than reflected in the emissions estimates that EPA used**

Devon believes that the condensate storage tank VOC emissions rate that is reflected in the tons per year of VOCs attributed to Wise County in the Rule is artificially high and that EPA also must grant reconsideration in order to take a close look at the appropriate emissions factor to use for such emissions. The relatively high rate of estimated VOC emissions from Wise County compared to its population is one of the factors that EPA appeared to have cited to in making its final decision to list the county in nonattainment. Since the comment period on the Rule closed, TCEQ has concluded that the emission factor should be corrected and has initiated a study to do exactly that. A corrected emission factor is likely to result in a significantly lower estimate for emissions from Wise County. This serves to further undermine the basis for listing Wise County as being in nonattainment.

TCEQ's new study is intended to develop updated county- and region-specific emission factors for estimating condensate storage tank emissions for each of the regions in Texas. These emissions are currently estimated using an emission factor from a 2006 Texas Environmental Research Consortium study entitled: "VOC Emissions from Oil and Condensate Storage Tanks," also known as the HARC study.[27] TCEQ used this emission factor to develop county-level area source VOC emissions estimates from condensate tanks at upstream oil and gas operations, including an estimate for Wise County. In turn, EPA relied on TCEQ's emissions estimate from Wise County as part of its basis for concluding that the county should be listed as being in nonattainment. Final DFW TSD at 6-9.

It is important to ensure that the emission factor for condensate storage tank emissions is correct because these tanks may be one of the biggest sources of VOC emissions from an oil and gas production sites. Flash emissions occur when produced liquid (crude oil or condensate) is exposed to pressure drops or temperature increases during transfer from pressurized production separators or similar sources into storage tanks at atmospheric pressure.[28] After examining those emissions, the HARC Study concluded that average VOC emission factor for condensate storage tanks is 33.3 pounds of VOC per barrel of liquid hydrocarbon produced (lb/bbl).

There is strong reason to believe that the current estimate of flash emissions at oil and gas sites from the condensate tanks—the estimate relied upon by EPA—significantly overestimates emissions. Devon has concerns about the conditions and duration of testing that underlie the HARC study, as well as other flaws. In particular, there are significant statistical outliers in the dataset that was used to establish the HARC study emission factor. The removal of the two most egregious of those outliers would result in a reduction by half of the emission factor. Based on Devon's on-the-ground experience and internal data, the likely emission factor should be much

[27] http://files.harc.edu/Projects/AirQuality/Projects/H051C/H051CFinalReport.pdf.

[28] http://www.tceq.state.tx.us/permitting/air/announcements/nsr_announce_9_30_09.html.

lower than the HARC study results.[29] Thus, Devon expects that TCEQ's ongoing study will confirm a much lower estimate than the HARC study result.

Given the significant oil and gas production in Wise County, a reduction of the storage tank emission estimate should result in a significant reduction in the overall emission estimate for the county. As Table 3 indicates, over 80% of the estimated emissions from Wise County are from condensate production. Further, of all the nonattainment counties, Wise County's total VOC emissions are the most influenced by emissions from condensate production. Therefore, a downward adjustment in the HARC emission factor would have the most significance for Wise County.

Table 3

County	EPA TSD VOC (tons)	% of tons VOC from Condensate (total)	2008 Condensate (Bbls)
Rockwall	2,047	0%	0
Kaufman	3,510	0%	0
Dallas	63,473	0%	0
Collin	14,503	0%	0
Tarrant	49,021	2%	57,008
Johnson	10,163	10%	59,214
Denton	24,932	31%	458,617
Parker	11,708	54%	380,805
Wise	17,609	84%	891,857

Now that TCEQ has recognized that the emission estimate is flawed and initiated a study to correct that emission estimate, EPA should reconsider whether to list Wise County as being in nonattainment. *See Catawba County*, 571 F.3d at 44-45 ("EPA has an obligation to deal with newly acquired evidence in some reasonable fashion.") (citation omitted). This new information indicates that Wise County's actual emissions are likely much lower than the information EPA relied upon to issue the Rule. Devon understands that TCEQ intends to complete the study by the end of August. Thus, this should not delay the needed reconsideration by EPA.

D. **EPA failed to adequately respond to key comments**

EPA did not adequately justify or explain why it promulgated the specific regulations that it included in the final Rules, as it is required to do. *See* CAA § 307(d)(6)(A). The CAA requires EPA to provide "a response to each of the significant comments, criticisms, and new data submitted in written or oral presentations during the comment period." *See id.* § 307(d)(6)(B). EPA's responses on a number of issues raised by commenters were cursory at best and

[29] Letter from Environ regarding Review and Analysis of HARC H51C Condensate Production VOC Emission Factor (May 16, 2011), attached as Attachment 1.

nonexistent at worst. For example, EPA's response to the complaint that EPA's designation of Wise County is "inconsistent, and therefore arbitrary and capricious, when compared to the standards and methods of analysis that were applied in other States by other EPA Regional Offices" is to claim that the commenter "failed to point to any specific concerns to support its claim." RTC at 58-59. Similarly, EPA claims a "fail[ure] to point to any specific circumstances that [a commenter] believes results in an inconsistency and therefore EPA cannot more specifically address the commenter's concerns." *Id.* at 61. EPA's claims of lack of specificity somehow ignores the pages and pages of detailed specific examples of inconsistent treatment provided by the Texas Pipeline Association and others. *See e.g.,* Texas Pipeline Association comments at 6-11, 14-20. That information clearly demonstrates multiple specific examples of inconsistent treatment between EPA Regions. The following subsection also indentifies comments that EPA failed to respond to.

E. **The comments already submitted amply demonstrate that Wise County should not be listed in nonattainment**

Devon and other commenters submitted many other reasons why EPA's proposal to list Wise County as being in nonattainment is not warranted and not supported by the record. EPA failed to respond to some of these important comments. These reasons include:

- There is no correlation between increased Barnett Shale exploration and production and increased ozone. The data illustrate that even with increased production, Design Values are generally down.[30] *It does not appear that EPA ever responded to this comment*.

- TCEQ has demonstrated through complex modeling that it is NOx, not man-made VOC that drives ozone formation in the DFW region. Their modeling concludes that elimination of 75% of man-made VOCs does little to reduce ozone concentration. Emissions from the Barnett Shale development are primarily VOCs, and further, the species of VOCs emitted by the oil and gas industry are straight chain alkanes and not the highly reactive VOC species (e.g. branched alkenes) that are linked to ozone formation.[31] *It does not appear that EPA ever responded to these comments*. *See e.g.*, RTC at 55-56 (noting the comment, but offering no response).

- The wind rose charts demonstrate that, on a yearly basis, the winds rarely blow into the DFW area from Wise County. TCEQ's findings, demonstrate that "at most 2.87% of the trajectory endpoints from Wise County impact violating monitors."[32]

[30] *See* Texas Pipeline Association Comments at 28-29.

[31] *See* Devon comments at 4.

[32] Comments submitted by Mark Vickery, Executive Director, TCEQ (EPA–OAR–HQ–2008–0476-0296).

- Other EPA Regions have declined nonattainment designations based simply on prevailing winds. TSDs from various Regions continuously make generalized references to prevailing wind patterns, 30-year wind history, wind roses showing yearly average wind direction, and references to "predominant" wind direction. [33]

Devon incorporates the prior comments of the Texas Pipeline Association, TCEQ and Devon, including but not limited to the comments summarized above, into these comments as part of the justification for why EPA should grant reconsideration and issue a stay.

III. Grounds for stay

A. A stay is warranted pursuant to both Section 307 of the CAA and Section 705 of the APA

Pending reconsideration, the Administrator should stay the Rule as it applies to Wise County. Both the APA and CAA Section 307(d)(7)(B) authorize an administrative stay during reconsideration. Given the potential multi-million dollar impact of these regulations on industry in Wise County and the significance of the issues addressed above, justice and basic principles of good government require that EPA stay the Rules.

EPA has broad authority and discretion to stay the effectiveness of rules promulgated under the CAA under both Section 307 of the CAA and Section 705 of the APA. The criteria that EPA must apply are significantly less stringent than the criteria generally used by the courts, for example, because a demonstration of irreparable harm is not mandatory:[34]

- First, CAA Section 307(d)(7)(B) provides that EPA may grant a stay if the Agency has decided to reconsider a rule. *See* 42 U.S.C. § 7607(d)(7)(B).[35] No other criteria or conditions are imposed on the Agency's authority to issue a stay.

- Second, "when justice so requires," EPA may stay the effective date of a CAA rule pending judicial review, under Section 705 of the APA, 5 U.S.C. § 705.[36] *See, e.g.*,

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[33] *See* Texas Pipeline Association comments at 8-10.

[34] Nothing in the CAA requires a showing of irreparable harm in order to justify an administrative stay; instead, all that is required are proper grounds for reconsideration. The APA deliberately contrasts what is required for an administrative stay ("justice so requires") and a judicial stay ("conditions as may be required" and "irreparable harm"). 5 U.S.C. § 705. Such differences must be given effect, and therefore there is no irreparable harm requirement for an administrative stay under the APA either.

[35] CAA § 7607(d)(7)(B) provides, in relevant part:

> If the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within such time or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed. … The effectiveness of the rule may be stayed during such reconsideration, however, by the Administrator or the court for a period not to exceed three months.

Final Rule, Amendments of Final Rule To Postpone Requirements, 61 Fed. Reg. 28,508 (June 5, 1996).

Thus, the only express condition imposed on EPA's authority to grant a stay under CAA § 307 is that the Agency must have decided to reconsider the rule. APA § 705 is similarly broad, authorizing EPA to issue a stay: (1) if judicial review is pending; and (2) when "justice so requires."[37] Of course, EPA also has the fundamental obligation to engage in reasoned decision making and must not make arbitrary and capricious determinations. All of these criteria leave EPA with considerable authority to stay the rules – especially under the current circumstances.

A stay under § 307 is clearly warranted. As discussed above, the CAA Section 307(d)(7)(B) standard for reconsideration is met, and it therefore follows that the standard for a stay under the CAA has similarly been met. In order to avoid the significant economic and social impacts—not just to Devon, but to the region and other impacts related to natural gas development in the county—of a rule that is arbitrary and should be reconsidered, justice requires that EPA grant the stay.

EPA's authority to issue a stay under APA Section 705 is even broader than Section 307 in two respects. First, 5 U.S.C. § 705 allows EPA to grant a stay "[r]egardless of whether [the stay request] meet[s] the requirements of Section 307(d)(7)(B)." *See* Ohio: Approval and Promulgation of Implementation Plans, 46 Fed. Reg. at 8,582 n.1. Second, EPA's stay authority is not limited to three months. Furthermore, nothing in the CAA has abrogated EPA's authority under § 705 of the APA. *See, e.g.*, CAA § 7607(d)(1) (specifying sections of the APA that do not apply to CAA rulemaking, but not including APA § 705). EPA has regularly used this authority to "postpone"[38] the effective date of a rule indefinitely. *See, e.g.*, Reconsideration of the Prevention of Significant Deterioration and Nonattainment New Source Review (NSR): Aggregation, 75 Fed. Reg. 27,643 (May 18, 2010); Final Rule, Amendments of Final Rule To Postpone Requirements, 61 Fed. Reg. 28,508 (June 5, 1996) (staying rules to prevent facilities from incurring "compliance expenditures . . . which may prove unnecessary in light of the projected amendments"); Hazardous Waste Management System: Identification and Listing of Hazardous Waste; Burning of Hazardous Waste In Boilers and Industrial Furnaces, 56 Fed. Reg. 43,874 (Sept. 5, 1991).

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[36] APA § 705 reads:

> When an agency finds that justice so requires, it may postpone the effective date of action taken by it, pending judicial review. On such conditions as may be required and to the extent necessary to prevent irreparable injury, the reviewing court, including the court to which a case may be taken on appeal from or on application for certiorari or other writ to a reviewing court, may issue all necessary and appropriate process to postpone the effective date of an agency action or to preserve status or rights pending conclusion of the review proceedings.

[37] Devon intends to file a petition for review and anticipates that other petitions for review will likely be filed.

[38] EPA can utilize the authority of APA § 705 either before, or after, the rules at issue have become effective. The plain meaning of the term "postpone" encompasses rules that are already in effect, just as a baseball game may be postponed after it has begun.

B. **Even under the more stringent judicial standard, a stay is warranted**

While a stay is warranted under the standards established by both the CAA and APA, it would be justified even under the more stringent standard employed by the courts. Courts typically consider four factors in determining whether to grant a judicial stay: "(1) whether the stay applicant has made a strong showing that he is likely to succeed on the merits; (2) whether the applicant will be irreparably injured absent a stay; (3) whether issuance of the stay will substantially injure the other parties interested in the proceeding; and (4) where the public interest lies." *Nken v. Holder*, 129 S. Ct. 1749, 1761 (2009). These factors must be balanced against one another, such that "[a] stay may be granted with either a high probability of success and some injury, or vice versa." *Cuomo v. US Nuclear Reg. Comm'n*, 772 F.2d 972, 974 (D.C. Cir. 1985). All four factors are amply satisfied in this case.

Failure to grant a stay will irreparably harm Devon. As discussed above, the incorporation of Wise County into the DFW nonattainment area would require Devon to make engine modifications, add additional control equipment and pay increased rental cost for leased compression to limit emissions from Devon's compression fleet to 0.5 g NOx/hp-hr. Devon estimates that this would impose a compliance cost in excess of $18 million in the first year alone.[39]

The nonattainment designation would also put Devon's E&P business at significant risk in future years. The lost net revenue on an enterprise wide basis could approach $17.2 million for every well that Devon would be prevented from drilling because of the regulations addressing the designation. For each well not drilled, Devon would not invest $2.95MM to support jobs and communities in Wise County. If Devon, for example, did not drill 25% of the remaining Wise County wells, the resultant decrease in revenue is estimated to be $4.3 billion.

There are no offsetting harms to third-parties or the public interest from the narrow stay sought by Devon. To the contrary, these factors strongly favor a stay. There will be no harm to others, as Wise County is not contributing to violations of the NAAQS, as discussed above. Thus, staying the Rule as it applies to Wise County while EPA reconsiders the Rule will have little, if any, discernable environmental impact. By comparison, absent a stay, the harm to others beyond Devon will be significant. For every dollar of impact to Devon and other parties regulated under the rule, there will be a spillover impact to economic activity, taxes and jobs in the local region and the state. A recent study estimated the "2011 total effect of Barnett Shale activity to include $11.1 billion in annual output and 100,268 jobs in the region," with the "majority of the stimulus com[ing] from exploration and drilling, pipeline development."[40] The multiplier of this impact is significant, with "cumulative economic benefits during the 2001-2011

[39] Unrecoverable economic loss can amount to irreparable harm. *See Thunder Basin Coal Co. v. Reich*, 510 U.S. 200, 220-21 (1994) (Scalia, J., concurring) ("[C]omplying with a regulation later held invalid almost always produces the irreparable harm of nonrecoverable compliance costs."); *Armour & Co. v. Freeman*, 304 F.2d 404, 406 (D.C. Cir. 1962) ("loss of profits which could never be recaptured" is irreparable harm).

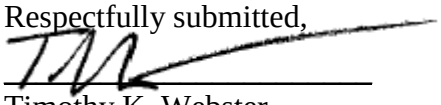
[40] The Perryman Group, *A Decade of Drilling: The Impact of the Barnett Shale on Business Activity in the Surrounding Region and Texas: An Assessment of the First Decade of Extensive Development* (Aug. 2011) (available at http://www.fortworthchamber.com/BarnettShaleStudy11.pdf). The report notes that Wise County is one of the primary areas of activity.

period include[ing] $65.4 billion in output (gross product) and 596,648 person-years of employment in the region."[41] Further, the state would lose significant tax revenue, impacting publicly provided services. Finally, as President Obama has recognized, there is a strong public interest in natural gas production, as it provides "jobs and … economic benefits to the entire domestic production supply chain, as well as to chemical and other manufacturers, who benefit from lower feedstock and energy costs" and it "reduce[s] our dependence on oil," as well as "provid[ing] a cleaner source of energy than other fossil fuels."[42] Any action that reduces the development of this important resource will harm jobs, the local and regional economies and the promotion of gas as a critical and environmentally favorable alternative to coal. The balance of harms and public interest, thus, clearly favor granting a stay.

IV. **Conclusion**

For the foregoing reasons, the Administrator must convene a proceeding for reconsideration of the Rule and stay the Rule pending reconsideration.

Respectfully submitted,



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Attachment 1 - Letter from Environ regarding Review and Analysis of HARC H51C Condensate Production VOC Emission Factor (May 16, 2011).

[41] *Id.* at 4.

[42] Executive Order, *Supporting Safe and Responsible Development of Unconventional Domestic Natural Gas Resources* (Apr. 13, 2012).

Attachment 1

ENVIRON

May 16, 2011

Mr. Grover Campbell
Manager Regulatory Affairs – Air Regulations
Chesapeake Energy Corporation
Oklahoma City, OK 73154-0496

Re: Review and Analysis of HARC H51C Condensate Production VOC Emission Factor

Dear Mr. Campbell:

As requested by Chesapeake Energy Corporation ("Chesapeake"), ENVIRON has performed a technical review of the October 31, 2006, report prepared by URS Corporation ("URS") entitled "VOC Emissions From Oil and Condensate Storage Tanks" (hereafter referred to as the "HARC H51C Report").[1] Following is a summary of ENVIRON's review specifically related to the derivation of the 33.3 lb VOC/bbl emission factor.

As presented within the HARC H51C Report, average VOC emission factors were derived from emission tests conducted on 21 tank batteries.[2] Figure 1 shows the relationship between the estimated VOC emission factor and production rate for these 22 sites.[3] As shown, 9 test sites had condensate production of less than 5 bbl/day.[4]

Derived tank battery-specific VOC emission factors ranged from 0.7 lb/bbl to 215.1 lb/bbl. Figure 1 presents the relationship between condensate production and estimated VOC emission factor for the 21 condensate storage tank batteries used by URS in the derivation of the VOC emissions as a function of condensate production emission factor.

For this data set, the mean VOC emission factor was 33.3 lb/bbl with a standard deviation of 53.3 lb/bbl.[5] As can be seen from Figure 1, there are two sites with much higher VOC emission factors compared to the other sites. These two sites are denoted with red diamonds. The emission factors and condensate production rates for these two sites are:

- 215.1 lb/bbl at a production rate of 1 bbl/day, and
- 145.1 lb/bbl at a production rate of 2 bbl/day.

[1] http://files.harc.edu/Projects/AirQuality/Projects/H051C/H051CFinalReport.pdf

[2] Results from testing conducted at a 22nd site, Tank Battery 26 with a derived emission factor of 1,218 lb/bbl, was discarded from the analysis with the reason given that the vent gas flow rate measurement was taken during non- representative conditions. Per the HARC H-51C Report, for Tank Battery 26, 97 percent of the measured vent gas was released during the first 8 hours of the 24-hour sampling period. The report attributed this condition to fracking at an adjacent well.

[3] Detailed HARC H-51C data is presented in Attachment A of this review.

[4] Based on our review of the report, it is our understanding that production rates were not measured during testing. Rather, URS requested and obtained production estimates from operators at a later date.

[5] The standard deviation, which is the variation around the mean, is approximately 1.6 times the mean for this data set, indicating high variability in the data. When the standard deviation exceeds the mean, it can imply that the data set is either too small to accurately determine the true mean value and/or there may not be a strong relationship between the two variables considered. Caution should be exercised when using a mean value derived from this data set.

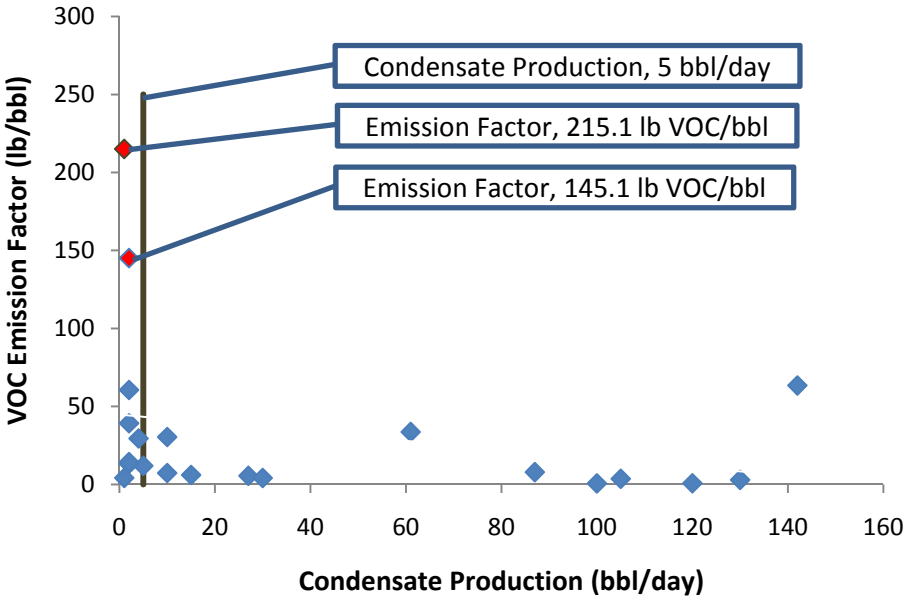

Figure 1. VOC Emission Factor as a Function of Condensate Production, Excluding Tank Battery 26
(Derived from HARC H51C Report)

To put these values into context:

- Condensate production of 1 bbl/day is equal to approximately 22.4 teaspoons per minute of condensate production. In other words, a fast drip.
- A production rate of 5 bbl/day is equal to about 18.7 fluid ounces per minute. At that rate, on average, it would take about 39 seconds to fill a 12 ounce soft drink can.
- A typical condensate storage tank is 12 feet in diameter with a cross-sectional area of approximately 113 ft^2. Adding 5 barrels to a tank of this size will raise the liquid level in the tank approximately 3 inches.
- Assuming a condensate specific gravity of 0.70, a barrel of condensate weighs approximately 245 lbs. An emission rate of 215.1 lb/bbl means that, on a mass basis, nearly as much VOC is being emitted as is being collected and recovered. Note that VOC already excludes emissions of methane and ethane.

Based on ENVIRON's experiences in managing tank testing programs as well as observations provided by natural gas liquids producers, making accurate measurements of condensate production at very low production levels is problematic.

Presented as Figure 2 is a "box-and-whisker" plot of the 21 data points used in deriving the 33.3 lb/bbl VOC emission factor. The box-and-whisker plot is a useful way of depicting observations graphically and also to identify outliers. The lower and upper limits of the central gray box represent the 25th and 75th percentiles, also known as the lower and upper quartiles of the data. The thin white band within the gray box is the median of the data. The red diamond is the mean of the data. The '*whiskers*' (short horizontal end cap lines) represents the lower and the upper extreme quartiles. The red circles represent data points that are at least 3 times the difference between the upper and lower quartiles (also called the intra-quartile range) above (or below) the median. Statistically, these red circles are "outside outliers." "Inside outliers are data points that

are more than 1.5 times but less than 3.0 times the inter-quartile range above (or below) the median.

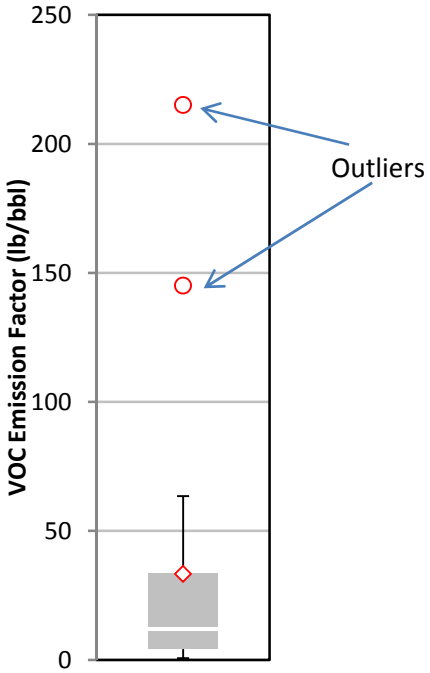

Figure 2. Box-and-Whisker Plot for All Data Points Used in Deriving 33.3 lb/bbl Emission Factor
(Derived from HARC H51C Report)

The two red circles in Figure 2 representing 215.1 lb VOC/bbl and 145.1 lb VOC/bbl emission factors for Tank Batteries 25 and 17, respectively, are outside outliers and, most likely, should be excluded from the analysis.

If the outside outliers identified in Figure 2 are excluded from the data set, the average VOC emission factor is 17.9 lb/bbl with a standard deviation of 19.5 lb /bbl. By excluding these two outliers, the standard deviation becomes smaller relative to the mean: 1.1 times the mean versus 1.6 times the mean when these two data points are not excluded. Therefore, the data shows better agreement when these two data points are excluded.

As noted, it is difficult to obtain accurate measurements of condensate production at low levels. If 5 bbl/day is used as the threshold for making reasonably accurate measurements of condensate production, then eight of the sites used in deriving the 33.3 lb/bbl emission factor should be excluded from the analysis. Figure 3 presents the relationship between VOC emission factor and condensate production for the 13 sites with measured production rates greater than or equal to 5 bbl/day.

The mean VOC emission factor for this data set is 13.8 lb VOC/bbl with a standard deviation of 18.3 lb VOC/bbl (1.3 times the mean). While showing less variability than the data set presented in Figure 1, the data shown in Figure 3 does demonstrate variability due to the three points shown as red diamonds.

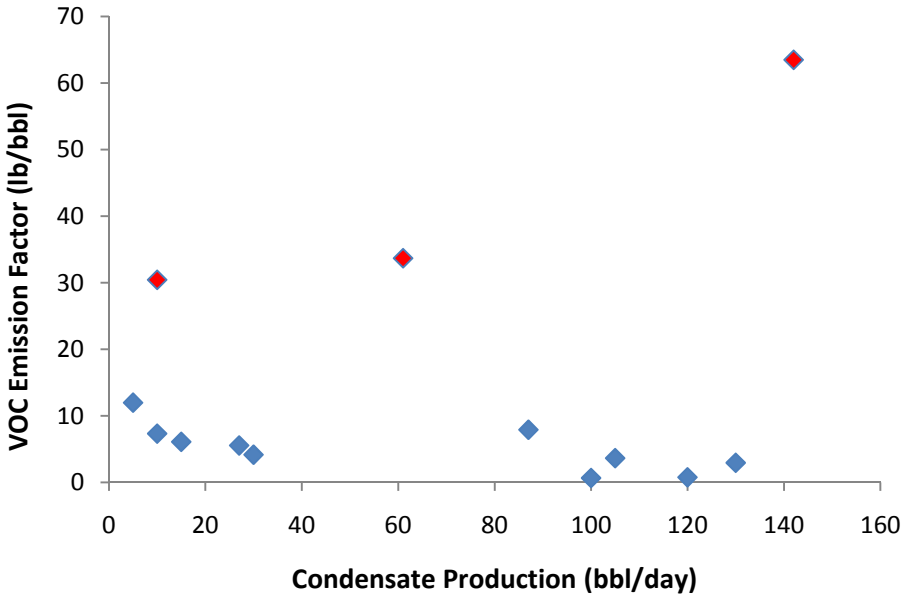

Figure 3. VOC Emission Factor as a Function of Condensate Production, Tank Batteries with Production ≥ 5 bbl/day
(Derived from HARC H51C Report)

Figure 4 is a box-and-whisker plot for derived VOC emission factors for 13 tank battery sites with condensate production greater than or equal to 5 bbl/day. As explained earlier in this summary, the box-and-whisker plot is a useful way of identifying outliers. The red circle in Figure 4 is an outside outlier. This represents the derived VOC emission factor for Tank Battery 32. The red stars in Figure 4 are inside outliers. The two stars represent the derived VOC emission factors for Tank Batteries 20 and 29.

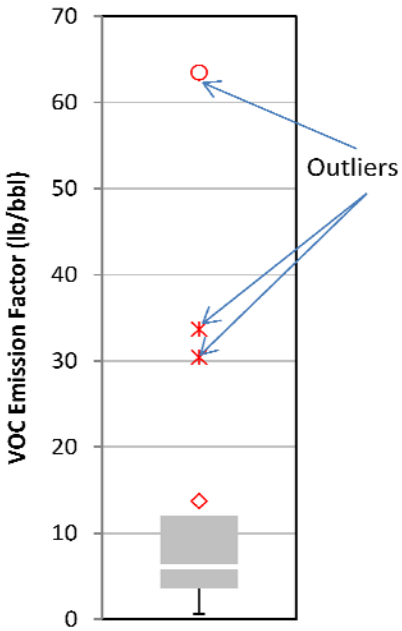

Figure 4. Box-and-Whisker Plot for Derived VOC Emission Factors, Tank Batteries with Production ≥ 5 bbl/day
(Derived from HARC H51C Report)

If the one site identified as an outside outlier in Figure 4 is excluded from the data set, the average VOC emission factor is 9.6 lb/bbl with a standard deviation of 11.0 lb /bbl. By excluding this one data point, the standard deviation becomes smaller relative to the mean: 1.1 times the mean versus 1.3 times the mean when this data point is not excluded. Therefore, the data shows better agreement when this data point is excluded.

If, in addition to the one outside outlier, the two inside outliers are excluded from the analysis, the average VOC emission factor is 5.1 lb/bbl with a standard deviation of 3.5 lb /bbl. By excluding these three points, the standard deviation becomes smaller relative to the mean: 0.7 times the mean versus 1.1 times the mean when just the outside outlier is excluded.

Note that, in this statistical analysis, the lowest derived emission factors – Tank Batteries 4 and 5 at 0.78 and 0.67 lb VOC/bbl, respectively – are not outliers. Thus, it is would not be appropriate to exclude them from the analysis.

A standard deviation lower than the mean indicates that the data are closely grouped around the mean. Assuming a "normal" distribution, 68% of the tank battery sites would have a VOC emission factor within one standard deviation of the mean and 95% of the tank battery sites would have a VOC emission factor within two standard deviations of the mean. Only the last data set considered exhibits a "normal" distribution.[6]

Table 1 presents a statistical analysis of various datasets presented in this review.

Table 1. VOC Emission Factors – Statistical Analysis

Dataset No.	Number of Tank Battery Sites	Condensate Production (bbl/day)	Mean VOC Emission Factor (lb VOC/bbl)	Standard Deviation (lb VOC/bbl)
1b[a]	21	All	33.3	53.3
1c[b]	19	All	17.9	19.5
3a	13	≥ 5	13.8	18.3
3b[c]	12	≥ 5	9.6	11.0
3b[d]	10	≥ 5	5.1	3.5

[a] Original HARC H51C data set.
[b] Original data set excluding the two outside outliers.
[c] Condensate production ≥ 5 bbl/day, excluding the one outside outlier.
[d] Condensate production ≥ 5 bbl/day, excluding the one outside and two inside outliers.

For comparative purposes, the Colorado Department of Public Health and Environment ("CDPHE") recommends VOC emission factors that range from 3.0 lb VOC/bbl to 13.7 lb VOC/bbl, for condensate storage tanks, depending on the location of the facility.[7,8]

[6] This data set consists of 10 tank batteries: 2, 3, 4, 5, 6, 15, 18, 23, 28 and 30.

[7] http://www.cdphe.state.co.us/ap/sbap/SBAPoilgastankguidance.pdf

[8] CDPHE recommends that these emissions factors should only be used if the total uncontrolled VOC emissions due to condensate tanks at the site are less than 80 tons per year. CDPHE recommends site-specific sampling and analysis to estimate emissions for sites having uncontrolled VOC emissions greater than 80 tons per year.

It should be noted that of the 21 tank batteries used in deriving the 33.3 lb VOC/bbl emission factor, 10 of the sites were operating at a separator discharge pressure of approximately 200 pounds per square inch ("psi"), one was operating at a discharge pressure of approximately 121 psi, and the remaining 10 sites were all operating at pressures of less than 50 psi. Instead of deriving a single emission factor, in ENVIRON's opinion, it may have been more appropriate to derive two emission factors: one for "high pressure" separation and one for "low pressure" separation.

Using the 3b dataset (condensate production ≥ 5 bbl/day, excluding the one outside and two inside outliers), derived emission factors for "high pressure" separators (operating at approximately 200 psi or greater) and "low pressure" separators (operating at less than 50 psi) are as follows.

- "High Pressure" Separators:
  - Data points = 3
  - Mean VOC Emission Factor = 16.6 lb/bbl
  - Standard Deviation = 12.2 lb/bbl
- "Low Pressure" Separators:
  - Data points = 7
  - Mean VOC Emission Factor = 4.0 lb/bbl
  - Standard Deviation = 2.5 lb/bbl

While these data subsets most likely have an insufficient number of test data points to accurately derive emission factors (especially for the high pressure separator subset), it is interesting to note that these subsets show better data correlation than do any of the larger datasets. For the low pressure separator data subset, the standard deviation is 0.6 times the mean. As previously noted, for the 3b dataset as a whole, the standard deviation is 0.7 times the mean.

Please let us know if you have any questions.

Best Regards,

Steven H. Ramsey, P.E., BCEE
Principal Consultant

Shagun Bhat, PhD
Senior Associate

Attachment A:
HARC H51C Report Site Data

Attachment A

(Derived from HARC H-51C Report)

Tank Battery Sites

Tank Battery	County	Area	Separator Discharge Pressure (psi)	API Gravity	Condensate Production (bbl/day)	Derived VOC Emission Factor (lb/bbl)
2	Montgomery	Houston-Galveston-Brazoria	41	42	105	3.65
3	Montgomery	Houston-Galveston-Brazoria	38	41	87	7.92
4	Montgomery	Houston-Galveston-Brazoria	34	40	120	0.78
5	Montgomery	Houston-Galveston-Brazoria	46	43	100	0.67
6	Montgomery	Houston-Galveston-Brazoria	33	39	130	2.96
13	Denton	Dallas-Fort Worth	~200	61	2	39.23
14	Denton	Dallas-Fort Worth	~200	59	4	29.51
15	Denton	Dallas-Fort Worth	~200	61	5	11.99
16	Denton	Dallas-Fort Worth	~200	61	2	60.58
17	Denton	Dallas-Fort Worth	~200	58	2	145.11
18	Denton	Dallas-Fort Worth	~200	58	10	7.34
19	Denton	Dallas-Fort Worth	~200	58	2	13.16
20	Denton	Dallas-Fort Worth	~200	59	10	30.43
23	Parker	Dallas-Fort Worth	39	48	27	5.56
24	Parker	Dallas-Fort Worth	36	41	1	4.22
25	Denton	Dallas-Fort Worth	~200	58	1	215.08
27	Denton	Dallas-Fort Worth	~200	59	2	14.39
28	Brazoria	Houston-Galveston-Brazoria	38	46	30	4.17
29	Brazoria	Houston-Galveston-Brazoria	41	42	61	33.68
30	Brazoria	Houston-Galveston-Brazoria	36	42	15	6.11
32	Galveston	Houston-Galveston-Brazoria	121	48	142	63.49