Joshua Smith

Sierra Club and Earthjustice submit these comments, on behalf of themselves and thousands of members and supporters who live, work, and recreate in the Bexar County nonattainment area, where the air is unhealthy to breathe. As discussed in the attached comments, the Texas Commission on Environmental Quality's ("TCEQ's") proposed Reasonably Available Control Technology ("RACT") State Implementation Plan ("SIP").

January 16, 2023

Via https://tceq.commentinput.com/

Denine Calvin
MC 206
State Implementation Plan Team
Air Quality Division, TCEQ
P.O. Box 13087
Austin, TX-78711-3087

Laurie Gharis
Chief Clerk, MC 105
TCEQ
P.O. Box 13087
Austin, TX 78711-3087

RE: Commission Approval for Proposal of the Bexar County 2015 Eight-Hour Ozone Standard Moderate Nonattainment Area Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) Revision Bexar County RACT SIP Revision , Non-Rule Project No. 2023-132-SIP-NR

Dear Director Chancellor and Chief Clerk Gharis,

Sierra Club and Earthjustice submit these comments, on behalf of themselves and thousands of members and supporters who live, work, and recreate in the Bexar County nonattainment area, where the air is unhealthy to breathe. As discussed more fully below, the Texas Commission on Environmental Quality's ("TCEQ's") proposed Reasonably Available Control Technology ("RACT") State Implementation Plan ("SIP")[1] is flawed and must be revised for the following reasons:

- First, Texas's Bexar RACT SIP unlawfully fails to include reasonably available control technology emission limitations and fails to rationally analyze such technologies.

[1] TCEQ, Bexar County 2015 Eight-Hour Ozone Standard Moderate Nonattainment Area Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) Revision Bexar County RACT SIP Revision, Non-Rule Project No. 2023-132-SIP-NR (Nov. 13, 2023) [hereinafter, "Bexar RACT SIP"].

- Second, as reflected in the attached modeling report of Sonoma Technology,[2] and the technical report of Dr. Ranajit (Ron) Sahu, Ph.D, QEP, CEM (Nevada),[3] Texas must impose reasonably available control technology emission limits equivalent to modern Selective Catalytic Reduction ("SCR") controls at CPS Energy's coal-burning Spruce power plant in San Antonio to address its impacts to ozone levels and public health.

- Finally, TCEQ must revisit the availability of RACT for other major source categories in Bexar County.

In addition, we attach and incorporate by reference comments from several Sierra Club members and supporters who live, work, recreate, own businesses, and breathe the air in the Bexar County nonattainment areas and are directly and adversely affected by ground-level smog. As the attached comments make clear, Texas's persistent and decades-long nonattainment crisis has real-world, everyday impacts on families, businesses, and tourism.

I. INTRODUCTION

Ozone nonattainment in Texas is a public health crisis. Almost half of Texans, over 48%, continue to live in areas that experience extremely high and frequent unsafe ozone levels that exceed EPA's health-based National Ambient Air Quality Standards ("NAAQS"), broadly encompassing Texas' largest urban areas. As discussed in more detail below, high ozone levels in Texas have documented adverse health impacts, including higher levels of asthma and asthma morbidity.[4] Residents living in Texas' urban and environmental justice communities with worse air quality, particularly residents of color, have much poorer health outcomes, reflected in asthma hospitalization rates and other measures.[5] Cities in Texas nonattainment areas have some of the highest environmental justice indices for ozone pollution according to the EPA.[6] Reducing ozone pollution, including nitrogen oxide ("NOx") emissions, an ozone precursor, is therefore essential to address the adverse and unjust health impacts affecting Texas residents.

Effective November 7, 2022, EPA reclassified the Bexar County nonattainment area from marginal to moderate nonattainment under the 2015 Ozone NAAQS, [7] meaning that air quality is currently unhealthy to breathe for the more than 2 million Texans who live, work, and recreate in

---

[2] Ex. 1, Lynn Alley & Kenneth Craig, Sonoma Technology, *Technical Memorandum Re: Analysis of Air Quality Impacts from Coal-Fired EGUs on Ozone Nonattainment Areas in Colorado, Indiana, Kentucky, Missouri, and Texas* (Mar. 2, 2023) [hereinafter, "Sonoma Report"].
[3] Ex. 2, Dr. Ranajit (Ron) Sahu, Analysis of NOx Emissions for Selected Coal-Fired Units [hereinafter, "Sahu Report"]; *see also* Ex. 3, Sierra Club, Analysis of NOx Emission Rates at Selected Coal Fired Electricity Generating Units with SCR [hereinafter "Sierra Club SCR Report"].
[4] *See infra.* Section II.b.
[5] *Id.*
[6] *State of the Air: Most Polluted Places to Live*, Am. Lung Ass'n (2022), https://www.lung.org/research/sota/key-findings/most-polluted-places.
[7] 87 Fed. Reg. 60,897 (Oct. 7, 2022).

the San Antonio area.[8] The moderate nonattainment reclassification requires Texas to submit a SIP that implements reasonably available control measures ("RACM"), "including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology" ("RACT") to reduce ozone precursor emissions and "shall" come into attainment as expeditiously as practicable.[9]

As discussed in more detail below, however, TCEQ's proposed Bexar RACT SIP fails to require any new reasonably available ozone precursor controls for any sources in the Bexar County area. Instead, TCEQ unlawfully concludes that existing control technology and emission limits already in place "meet or exceed RACT requirements," and "further emission controls on the sources are either not technologically or economically feasible."[10] TCEQ's own "modeling and available data," however, shows that "Bexar County is not expected to attain the 2015 ozone NAAQS by the September 24, 2024 attainment date."[11] In other words, TCEQ's own data makes clear that existing control technology and rules are not sufficient to ensure attainment as expeditiously as practicable, and therefore do not meet the Clean Air Act's requirements.[12]

TCEQ's Bexar RACT SIP fails to undertake any rational analysis to support the finding that Texas's existing RACT requirements meet Clean Air Act requirements. Indeed, a brief review of RACT standards governing emissions of oxides of nitrogen ("NOx") in other jurisdictions finds stronger RACT standards are technologically- and economically-feasible, and must therefore be required for Bexar County sources. Similarly, an analysis of sources of volatile organic compounds ("VOCs") is also necessary to rationally back any proposal for RACT for VOC sources.

Moreover, and as discussed in detail below, TCEQ must reevaluate its RACT and RACM analyses for coal-fired EGUs, which play an outsized role in ozone nonattainment in Bexar County. Texas's coal EGUs sources are poorly controlled compared to coal units in the rest of the country–the large majority (over 65%) of Texas' coal fired EGUs lack basic modern pollution controls for NOx—selective catalytic reduction ("SCR") technology—compared to a national average of only 35% without these controls.[13] Moreover, of the few Texas coal fired EGUs that do have SCRs, most (75% of units) are not even using their SCR controls consistent with their SCR's lowest demonstrated NOx emission capabilities.[14] As explained in more detail below, modeling conducted by Sonoma Technology demonstrates that coal fired EGUs are a

---

[8] https://www.census.gov/quickfacts/fact/table/bexarcountytexas/PST045222
[9] 87 Fed. Reg. at 60,900; 42 U.S.C. §§ 7502(c)(1); 7511a(b)(1) and (2).
[10] Bexar RACT SIP, App'x A, Reasonably Available Control Technology Analysis at 7 [hereinafter, "Bexar RACT Analysis"].
[11] See TCEQ, Bexar County Moderate Area Attainment Demonstration (AD) State Implementation Plan (SIP) Revision for the 2015 Eight-Hour Ozone National Ambient Air Quality Standard (NAAQS) Bexar County 2015 Ozone NAAQS Moderate AD SIP Revision Non-Rule Project No. 2022-025-SIP-NR (May 12, 2023) [hereinafter, "Bexar AD SIP"]..
[12] 42 U.S.C. §§ 7502(c)(1), (4), (6); 7511a(b).
[13] *See* Section II.a.
[14] *See id.*

major driver of high ozone levels in nonattainment areas and environmental justice communities, including on the days with the highest and most dangerous ozone levels.[15] As a result, Texas must impose emission limits for NOx equivalent to selective catalytic reduction ("SCR") technology on coal fired EGUs affecting air quality in the Bexar County area to reduce ozone precursor emissions and their public health harms. Alternatively, and at a minimum, TCEQ must immediately impose plantwide emission reductions at the Texas coal EGUs impacting air quality in the San Antonio area, which would also result in significant reduction in harmful greenhouse gas, sulfur dioxide ("SO_2"), nitrogen oxides ("NOx"), mercury, and particulate matter 2.5 ("$PM_{2.5}$") emissions. The corresponding addition of renewable energy generation to replace that fossil fuel generation (which is already occurring) will result in the creation of thousands of jobs and save millions in Texas retail electricity costs.

II. BACKGROUND

A. Ground-Level Ozone Is Dangerous to Human Health

Exposure to ozone, the main component of smog, has detrimental effects on human health. Ozone exposure, even short-term exposure, is linked to chronic conditions affecting the respiratory, cardiovascular, reproductive, and central nervous systems, as well as mortality.[16] Respiratory symptoms of ozone exposure include coughing, wheezing, and shortness of breath.[17] Notably, ozone exacerbates asthma and can contribute to new onset asthma.[18] Accordingly, ozone exposure is associated with increased asthma attacks, emergency room visits, hospitalization, and medication for asthma.[19]

The health effects of ozone exposure are cumulative, increasing with higher ozone concentrations and increased exposure time.[20] The impacts of ozone exposure on the respiratory system can occur at concentration levels below the 2015 eight hour ozone NAAQS of 70 parts per billion (ppb).[21] In fact, ozone concentrations as low as 60 ppb can cause inflammation and decreased lung function in healthy, exercising adults after 6.6 hours of exposure.[22] Furthermore, studies have observed an association between short-term ozone exposure and hospital admission

---

[15] *See* Section II.b.

[16] *See* EPA, Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards (EPA-HQ-OAR-2008-0699-0404, Aug. 2014).

[17] *Id*. at 3-27.

[18] *Id*. at 3-28.

[19] *See id*.

[20] *See id*.

[21] EPA, National Ambient Air Quality Standards for Ozone, 80 Fed. Reg. 65,292, 65,292 (Oct. 26, 2015).

[22] EPA, Integrated Science Assessment for Ozone and Related Photochemical Oxidants at IS-1 (2020), available at https://www.epa.gov/isa/integrated-science-assessment-isa-ozone-and-related-photochemical-oxidants/.

or emergency department visits at concentrations as low as 31 ppb.[23] Ozone concentrations are highest outdoors, but exposure occurs indoors as well.[24]

While the health impacts of ozone are ubiquitous, certain populations are at an increased risk for ozone-related health effects. Those populations include people with asthma and/or lung disease, children, people over the age of 65, pregnant people, people of color, and outdoor workers.[25] Factors contributing to an individual's risk of ozone-induced health burdens include exposure, susceptibility, access to healthcare, and psychosocial stress.[26] These factors can intersect to place certain individuals at even greater risk. For example, children experience increased exposure to ozone because they are more likely to spend time being active outdoors, and increased susceptibility to the health impacts due to their developing lungs and higher occurrences of respiratory infections than adults.[27]

The pervasive impacts of ozone exposure disproportionately burden communities of color and economically marginalized populations. Higher levels of exposure can be attributed to the historical siting of polluting facilities in marginalized communities as opposed to more affluent, predominantly white neighborhoods.[28] Accordingly, people of color, especially Black individuals, carry a higher asthma burden than white people, and are overrepresented in the nation's ozone nonattainment areas. Furthermore, people of color are more susceptible to the impacts of air pollution, such as asthma, diabetes, and heart condition, because they are more likely than white individuals to be living with one or more chronic conditions.[29]

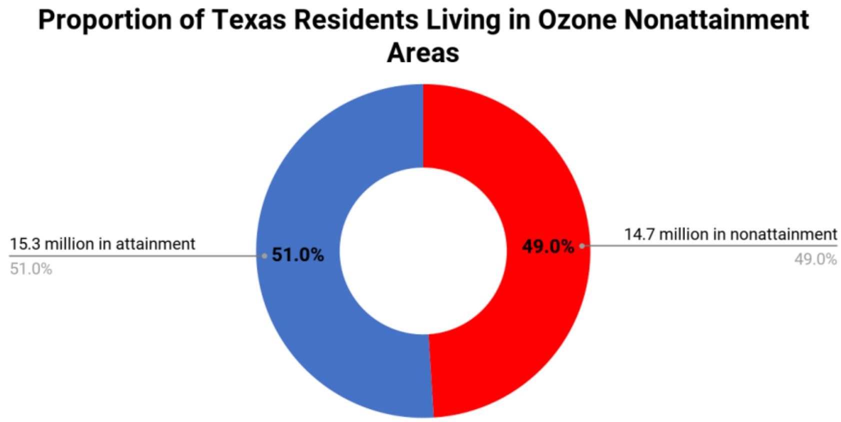
B. Texans Continue To Experience Extremely High and Frequent Ozone Levels Far In Excess Of Minimum National Ambient Air Quality Standards, Particularly In Urban Areas And In Communities Of Color.

Texas has a clear and persistent problem with high levels of ozone pollution far in excess of minimum national ambient air quality standards. Three areas (DFW, HGB, and Bexar County) are now designated and classified as moderate nonattainment under the 2015 ozone NAAQS, and two areas (DFW and HGB) are also designated and classified as severe nonattainment under the 2008 ozone NAAQS. As reflected below, nearly half of all Texans now live in areas that

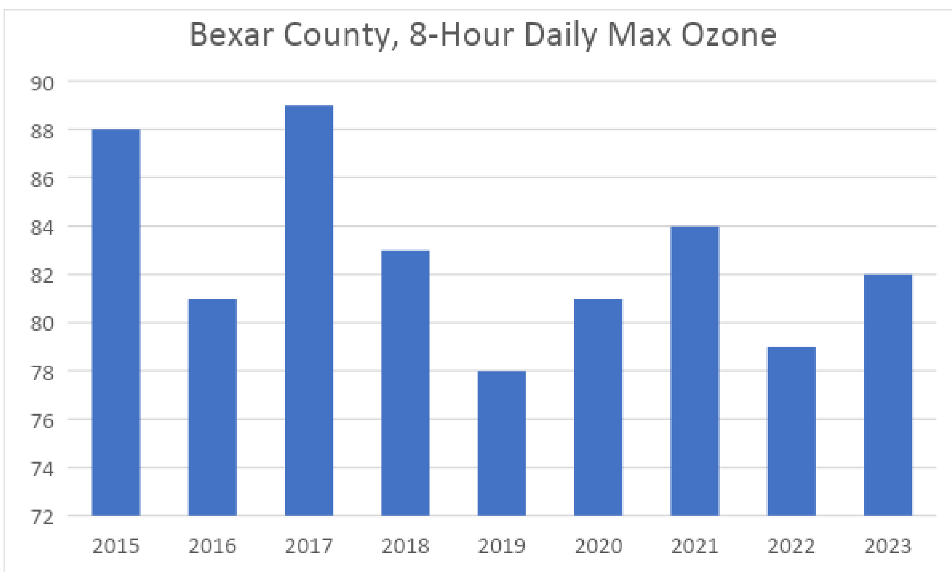
---

[23] *Id*. at IS-27.
[24] EPA. Integrated Science Assessment for Ozone and Related Photochemical Oxidants at 1-3 (2013), available at https://www.epa.gov/isa/integrated-science-assessment-isa-ozone-and-related-photochemical-oxidants/.
[25] *Id*. at 2-30; EPA, National Ambient Air Quality
Standards for Ozone, 80 Fed. Reg. 65,292, 65,310 (Oct. 26, 2015).
[26] American Lung Ass'n, State of the Air 2022, Tracking Air Pollution & Championing Clean Air 25 (2022), available at https://www.lung.org/getmedia/74b3d3d3-88d1-4335-95d8-c4e47d0282c1/sota-2022/.
[27] *Id*. at 26.
[28] *Id*.
[29] *Id*.

repeatedly experience air that EPA has determined is unsafe to breathe.[30] These disproportionate pollution burdens result in inequitable, poorer health outcomes among disadvantaged, already overburdened communities of color.



More than two million Texans live in the Bexar County nonattainment area, which continues to log exceptionally high 8-hr daily ozone values, reaching as high as 82 ppb—nearly 20% higher than the 70 ppb NAAQS—at the Heritage Middle School monitor in 2023.[31]



---

[30] *See* Population in Nonattainment.xlsx; *Summary Nonattainment Area Population Exposure Report*, EPA (last accessed Feb. 10, 2023), https://www3.epa.gov/airquality/greenbook/popexp.html. Data was sourced from this report and compared to the latest Census numbers for Texas.

[31] https://www.tceq.texas.gov/cgi-bin/compliance/monops/8hr_4highest.pl (last accessed Jan. 14, 2024.

The San Antonio area also experiences numerous ozone exceedance days annually, with Bexar County regulatory monitors experiencing 19 exceedance days in 2023 alone.[32] As the monitoring data shows, Bexar County is far from meeting the 2015 ozone NAAQS, and communities in and around San Antonio are routinely exposed to extremely high ozone concentrations.

C. Texas' High Ozone Levels In the San Antonio Area Have an Adverse Impact On Environmental Justice Communities.

The adverse health impacts of ozone exposure do not affect all Bexar County residents equally. EPA's EJScreen tool shows that populations in the San Antonio nonattainment area have high environmental justice index values for ozone considering both exposure to pollution and socioeconomic indicators.[33] These impacts are reflected in disproportionately poor health outcomes for people of color in Texas' environmental justice communities.

The EJ index for ozone is calculated by combining the environmental factor of ozone concentration with demographic factors, including the low-income and people of color populations residing in a geographic area.[34] In San Antonio, the EJ index for ozone is in the state's 71st percentile and the 64th percentile nationwide. Thus, ozone pollution disproportionately and adversely impacts people of color and low-income populations in Bexar County.

The unequal burden of ozone-caused public health impacts in Texas is borne out by asthma data. Asthma is one of the primary public health impacts of ozone exposure and affects Black communities at disproportionate rates in Texas, measured by emergency department visit, hospitalization, and death rates:[35]

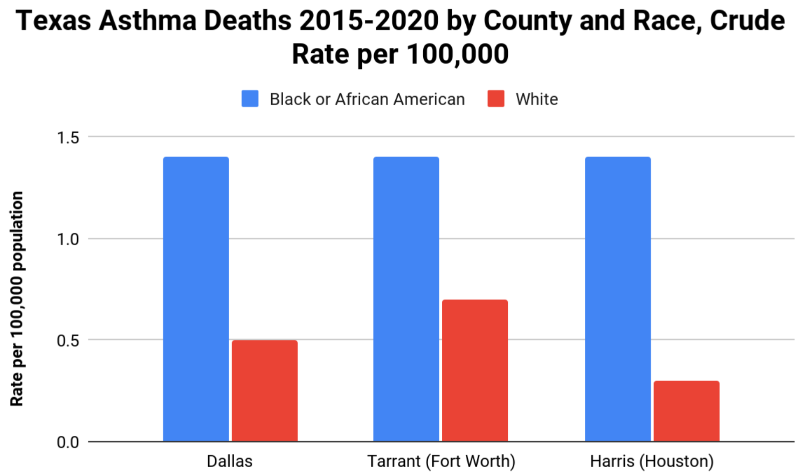
---

[32] *See* Daily Max & Exceedances.xlsx; *Outdoor Air Quality Data, Air Data - Ozone Exceedances*, EPA (last accessed Jan. 14, 2024), https://www.epa.gov/outdoor-air-quality-data/air-data-ozone-exceedances.

[33] *See EJScreen*, EPA (last accessed Feb. 13, 2023), https://ejscreen.epa.gov/mapper/. Numbers for each city were generated by selecting the city or county, and generating the "Printable Standard Report."

[34] For EPA's explanation of this indicator, see *EJ and Supplemental Indexes in EJScreen*, EPA (last accessed Feb. 13, 2023), https://www.epa.gov/ejscreen/ej-and-supplemental-indexes-ejscreen

[35] Houston Health Dep't, *Houston Asthma Burden Report 2021*, 21, 34 (2021), https://www.houstontx.gov/health/asthma/documents/houston-asthma-burden-report.pdf (emergency department visit and hospitalization rates). Changes in hospital reporting lead to the shift observed in the distribution of asthma hospitalizations by ethnicity. CDC Wonder, *Underlying Cause of Death Data* (last accessed Feb. 10, 2023), https://wonder.cdc.gov/ (death rates).



Reducing ozone pollution and NOx emissions, a precursor to ozone pollution, is therefore essential to reduce the unequal public health harms unjustly borne by low income populations and people of color in Texas. As discussed below, addressing Texas' abysmally poorly controlled coal-fired EGUs is key to addressing the poor health outcomes of Texas' urban environmental justice communities.

D. Texas' Poorly Controlled Coal-Fired EGUs Are Major Drivers Of Texas' Extraordinarily High Ozone Levels.

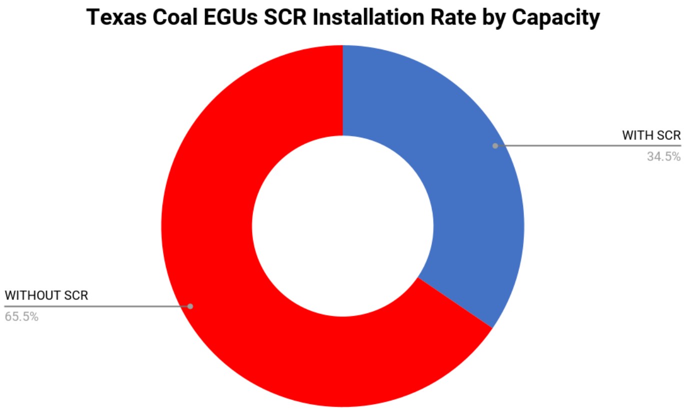
As part of its May 2022 Bexar County SIP revision, TCEQ conducted photochemical modeling that confirms that Bexar County will continue to fail to meet the NAAQS.[36] Coal-fired EGUs are a significant source of the NOx emissions in Texas that contribute to that problem, yet TCEQ's proposed RACT SIP fails to include any new measures to control those emissions. Specifically, TCEQ must require JK Spruce Unit 1 to install and operate basic, modern NOx pollution controls–SCRs–to address nonattainment issues in Bexar County. Moreover, the attached Sahu Report demonstrates that Spruce Unit 2's emission rate can be cost-effectively improved. Finally, as the Sonoma Report demonstrates, coal plants across central and east Texas impact ozone levels in the San Antonio area, and therefore TCEQ must evaluate whether there are reasonably available control measures for those intrastate sources that could advance attainment.

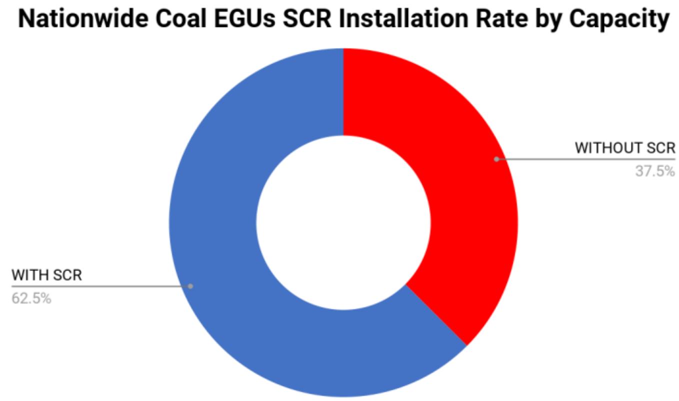
1. Overview: Coal Plants in Texas Nonattainment Areas

There are 29 coal fired EGUs in Texas, representing a total capacity of 18,296 MW. In 2021, these plants were responsible for 55,349 tons of NOx emissions, or 6.6% of total NOx emissions in Texas.[37] Despite the prevalence of modern pollution controls on large coal units

[36] Bexar County AD SIP at ES-3.
[37] *See* NOx Contribution.xlsx; *Air Pollutant Emissions Trend Data*, EPA (last accessed Feb. 10, 2023), https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data;

nationwide, only 35% of the total coal EGU capacity has SCR controls in place to reduce emissions. This is approximately half the national average: 62% of coal EGUs nationwide utilize SCR:[38]





Sierra Club's analysis of existing SCR installation in the coal fired EGU fleet nationwide demonstrates that SCRs are widespread, in agreement with the EPA's findings in April 2022.[39] Nationally, 56% of coal fired EGUs over 100MW have SCR controls, covering 62% of capacity in megawatts. Thus, nationwide more than half and almost two-thirds of total capacity already have implemented SCR controls.

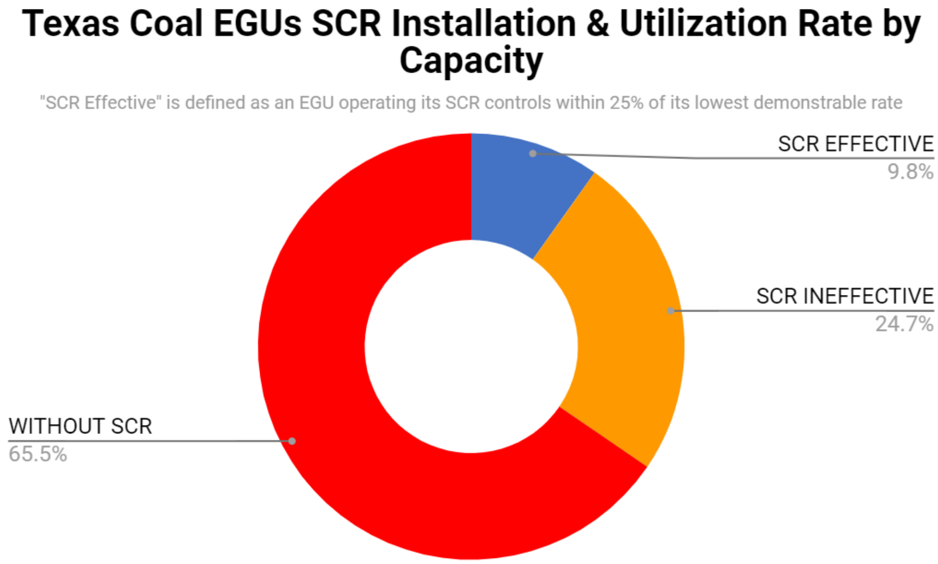
Moreover, the vast majority of the mere 35% of Texas' coal fired EGUs that have installed SCRs are not even operating the controls at their full capabilities. Indeed, 75% of units do not use installed SCR controls consistent with their SCR's lowest demonstrated NOx emission capabilities:[40]

CAMPD Power Plant Emissions, Compliance, and Allowance Data, EPA (last accessed Feb. 10, 2023), https://campd.epa.gov. NEI data was sorted by state and pollutant type to identify annual total NOX emissions within a given state. Coal EGU NOx emissions data for each state was downloaded, then compared to NEI data above to determine in-state NOx emissions attributable to coal EGUs.

[38] *See* SCR Installation & Utilization.xlsx; *CAMPD Power Plant Emissions, Compliance, and Allowance Data*, EPA (last accessed Feb. 10, 2023), https://campd.epa.gov. *S&P Capital IQ Pro*, S&P Global, (last accessed Dec. 3, 2022), https://www.marketplace.spglobal.com/en/datasets/snl-energy-(9).

[39] 87 Fed. Reg. 20036, 20,094 (Apr. 6, 2022), https://www.govinfo.gov/content/pkg/FR-2022-04-06/pdf/2022-04551.pdf.

[40] *See infra* n. 90 and accompanying table (SCR Installation and Utilization on Texas' Coal-Fired EGUs).



In short, installation of SCR control technology on Texas coal plants lags far behind nationwide installation of SCRs. Of those plants that do have SCRs, their emission limits are currently too lax to even require consistent SCR operation at their full demonstrated potential.

As demonstrated below, Texas must, at a minimum, impose NOx emission limits at the coal-fired JK Spruce power plant, reflecting the installation and efficient operation of SCR controls at each EGU. Texas coal plants, and Spruce in particular, are major drivers to the Bexar County nonattainment problem, and only through stringent new emission limits commensurate with installation and consistent operation of SCR can Texas meet the Clean Air Act's RACT and RACM requirements or begin to address the environmental justice consequences of its poorly controlled coal fired EGU fleet.

2. <u>CAMx Ozone Source Apportionment Technology Modeling by Sonoma Technology Confirms that Coal-Burning EGUs Are Major Drivers of High Ozone Levels in San Antonio.</u>

Sierra Club retained Sonoma Technology to model the ozone impacts of Texas' coal fired EGU fleet on nonattainment areas and environmental justice communities using the Comprehensive Air Quality Model with Extensions ("CAMx") with Ozone Source Apportionment Technology ("OSAT") for the 2016 ozone season (April to October) in Texas.[41] The source apportionment modeling simulations used the EPA's 2016v2 (2016fj_6j) modeling platform, which relies on emissions data from the National Emissions Inventory.[42] Sonoma Technology found that emissions from coal-fired EGUs in Texas repeatedly have combined impacts of *greater than 1%* of the 2015 ozone NAAQS at AQS monitoring locations and EJ zip codes within the Bexar County nonattainment areas, often exceeding 1 ppb. As reflected in the

[41] Ex. 1, Sonoma Technology Report.
[42] For an in-depth explanation of the data analysis methods of this report, *see id.* at 1-2, App'x A.

tables below, EGU impacts above 0.5% and 1% of the NAAQS often coincided with days when monitored maximum daily average 8-hour ozone concentrations exceeded the 2015 ozone NAAQS.

EPA has consistently found that where contributions from *all anthropogenic emissions in an upwind state* exceed 1% of the ozone NAAQS, those emissions are significant contributions to downwind nonattainment, and should therefore be reduced.[43] Similarly, results showing that *Texas coal units alone* contribute more than 1% of the ozone NAAQS to the Bexar County area on high ozone days are significant, and TCEQ should evaluate whether emissions from those sources should be controlled to advance attainment.

3. <u>The Coal-Fired JK Spruce EGUs Have Significant Ozone Impacts in the Bexar County Nonattainment Area.</u>

On days in 2016 that exceeded the 2015 ozone NAAQS of 70 ppb, the ozone impacts from coal fired EGUs in Texas frequently exceeded 0.5% and 1% of the ozone NAAQS in Bexar County. As shown in Table 13, for example, the JK Spruce power plant in San Antonio is frequently responsible for greater than 0.5% contribution to violations of the NAAQS within Bexar County. The Sonoma modeling also reflects significant contributions to communities in San Antonio where monitors are not located.

Table 13. Modeled impacts from JK Spruce facility (Unit 1, no SCR + Unit 2, with SCR combined) at AQS monitors and EJ zip codes in the San Antonio ozone nonattainment area on days in 2016 that exceeded the 2015 ozone NAAQS of 70 ppb. 8-hr maximum modeled ozone contributions are relative values (ppb) at AQS monitors and absolute values (ppb) at EJ zip codes. Values that equal or exceed 1% of the NAAQS (0.70 ppb) are highlighted in red, while values that equal or exceed 0.5% of the NAAQS (0.35 ppb) are highlighted in yellow.

Date	Calaveras Lake	Camp Bullis	San Antonio Northwest	Zip 78101	Zip 78112	Zip 78221	Zip 78223	Zip 78263	Zip 78264
5/5			0.16	0.33	0.55	0.38	0.36	0.33	0.60
5/6			0.81	0.65	0.13	0.71	0.79	0.65	0.15
9/28	0.42			0.25	0.16	0.05	0.11	0.25	0.09
10/2		0.58	0.61	1.28	1.46	1.61	1.62	1.28	1.62
10/11		0.23	0.11	0.76	0.54	0.31	0.56	0.76	0.29

Texas's uncontrolled coal plants *outside* the Bexar County nonattainment area collectively have even more pronounced impacts on the Bexar nonattainment area. As reflected in Table 9 of the Sonoma Report,[44] included below, Texas's coal plant contributions to high ozone levels exceeded 1% of the 70 ppb 2015 ozone NAAQS on three out of the five days that Bexar County monitors were in nonattainment in 2016.

---

[43] *See, e.g.*, 88 Fed. Reg. 36,654 (June 5, 2023).
[44] *Id.* at 18.

Table 9. Modeled impacts from all selected coal-fired EGUs[1] in Texas (with/without SCR) at AQS monitors and EJ zip codes in the San Antonio ozone nonattainment area on days in 2016 that exceeded the 2015 ozone NAAQS of 70 ppb. 8-hr maximum modeled ozone contributions are relative values (ppb) at AQS monitors and absolute values (ppb) at EJ zip codes. Values that equal or exceed 1% of the NAAQS (0.70 ppb) are highlighted in red, while values that equal or exceed 0.5% of the NAAQS (0.35 ppb) are highlighted in yellow.

Date	Calaveras Lake	Camp Bullis	San Antonio Northwest	Zip 78101	Zip 78112	Zip 78221	Zip 78223	Zip 78263	Zip 78264
5/5			0.16	0.33	0.56	0.38	0.37	0.33	0.62
5/6			1.64	1.43	1.03	1.53	1.58	1.43	1.09
9/28	0.46			0.28	0.20	0.09	0.14	0.28	0.13
10/2		1.56	1.50	2.13	2.32	2.43	2.44	2.13	2.49
10/11		1.06	1.04	1.30	1.28	1.09	1.21	1.30	1.24

[1] Selected coal-fired EGUs in Texas include: Coleto Creek, Fayette, JK Spruce, Limestone, Martin Lake, San Miguel, Tolk, Twin Oaks, TWA Parish, and Welsh

4. <u>Texas's Coal Fired EGU's Also Have Significant Ozone Impacts On Environmental Justice Communities In Nonattainment Areas.</u>

Deeply alarming are the outsized impacts that the Sonoma Report shows Texas's coal fired EGUs are having on environmental justice communities in nonattainment areas. To measure the impact of Texas's coal fired EGUs on these communities, environmental justice communities in nonattainment areas were asked to identify the United States Postal Service ZIP Codes that correlated with their communities. Sonoma placed modeling receptors that correlated with these communities' postal ZIP Codes. Often, these communities are not well reflected in the AQS monitoring network. The location of these EJ community ZIP Codes, of existing AQS monitors, and of coal fired EGUs, are identified in the map included below.[45]

As the map in Figure 3 of the Sonoma Report illustrates, the Bexar County monitors are not well located to record ozone levels in those communities. For example, at least two of the environmental justice ZIP Codes Sonoma modeled were located downwind of the JK Spruce power plant, in communities that lack AQS monitors, which are farther away. And as the Sonoma Report tables included above demonstrate, the JK Spruce's impacts exceed 1% of the NAAQS in the environmental justice communities that were modeled by Sonoma on almost every day that the ozone monitors in Bexar County registered an ozone nonattainment day.[46]

45 *Id.* at 20.

46 Sonoma Technology's analysis demonstrates that EPA's 2016 ozone modeling platform underpredicts ozone levels when compared to actual monitored ozone data at AQS monitor sites, as reflected in Appendix B to the Sonoma Report, which compares actual monitored ozone levels

III. LEGAL COMMENTS

A. TCEQ's RACT Plans Are Fundamentally Deficient.

Under the Clean Air Act, moderate and higher ozone nonattainment areas must develop plans that require "implementation of reasonably available control technology under [42 U.S.C. §] 7502(c)(1)" for sources covered by a Control Techniques Guidelines (CTG) and all major stationary sources of VOC and NOx. 42 U.S.C. § 7511a(b)(2), (f). RACT is "the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[47] RACT "means devices, systems, process modifications, or other apparatus or techniques that are reasonably available taking into account: (1) [t]he necessity of imposing such controls in order to attain and maintain a national ambient air quality standard; [and] (2) [t]he social, environmental, and economic impact of such controls" 40 C.F.R. § 51.100(o). In fact, RACT may even encompass "stringent, or even 'technology forcing,' requirement[s]."[48] EPA has interpreted RACT "as requiring the toughest controls considering technological and economic feasibility that can be applied to a specific situation . . . [a]nything less than this is *by definition less than RACT* and not acceptable for areas where it is not possible to demonstrate attainment."[49] It is "not designed to rubber-stamp existing control methods. It is a technology-forcing mechanism."[50] Moreover, as TCEQ correctly recognizes, unlike RACM, which TCEQ has interpreted to require that an emission control measure "advance attainment of the area towards the meeting the NAAQS, advancing attainment of the area is "not a factor of consideration when evaluating RACT because the benefit of implementing RACT is presumed."[51] Thus, TCEQ must adopt and implement technologically and economically feasible RACT for all sources in the Bexar county

---

at AQS monitors with to modeled values which are denoted in parentheticals. For modeling receptor sites where there were actual AQS monitored data, Sonoma calibrated the modeled values to match the monitored values. For many of the USPS ZIP codes that identify environmental justice communities, there were no AQS monitors to calibrate to, meaning that the modeled ozone contributions at those sites actually understate the ozone contributions of coal fired EGUs to those receptors on nonattainment days.

[47] Memorandum from R. Strelow, Asst. Adm'r, EPA, Office or Air and Waste Management, to Reg'l Adm'rs, EPA Regions I-X, re: Guidance for Determining Acceptability of SIP Regulations in Non-Attainment Areas at 2 (Dec. 9, 1976), *available at* https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/19761209_strelow_ract.pdf [hereinafter "Strelow Memo"].

[48] Strelow Memo at 2; *accord Sierra Club v. EPA*, 972 F.3d 290, 294 (3d Cir. 2020) ("RACT is a technology-forcing standard designed to induce improvements and reductions in pollution for existing sources."); *see also Whitman v. Am. Trucking Ass'ns,* 531 U.S. 457, 492 (2001) (Breyer, J., concurring) (noting that technology forcing requirements "are still paramount in today's [Clean Air] Act").

[49] *Sierra Club v. EPA*, 972 F.3d 290, 294 (3d. Cir. 2020) (quoting Strelow Memo) (emphasis added).

[50] *Id.*

[51] Bexar RACT SIP at 4-5.

nonattainment area, regardless of whether those measures advance attainment before the 2024 attainment deadline.

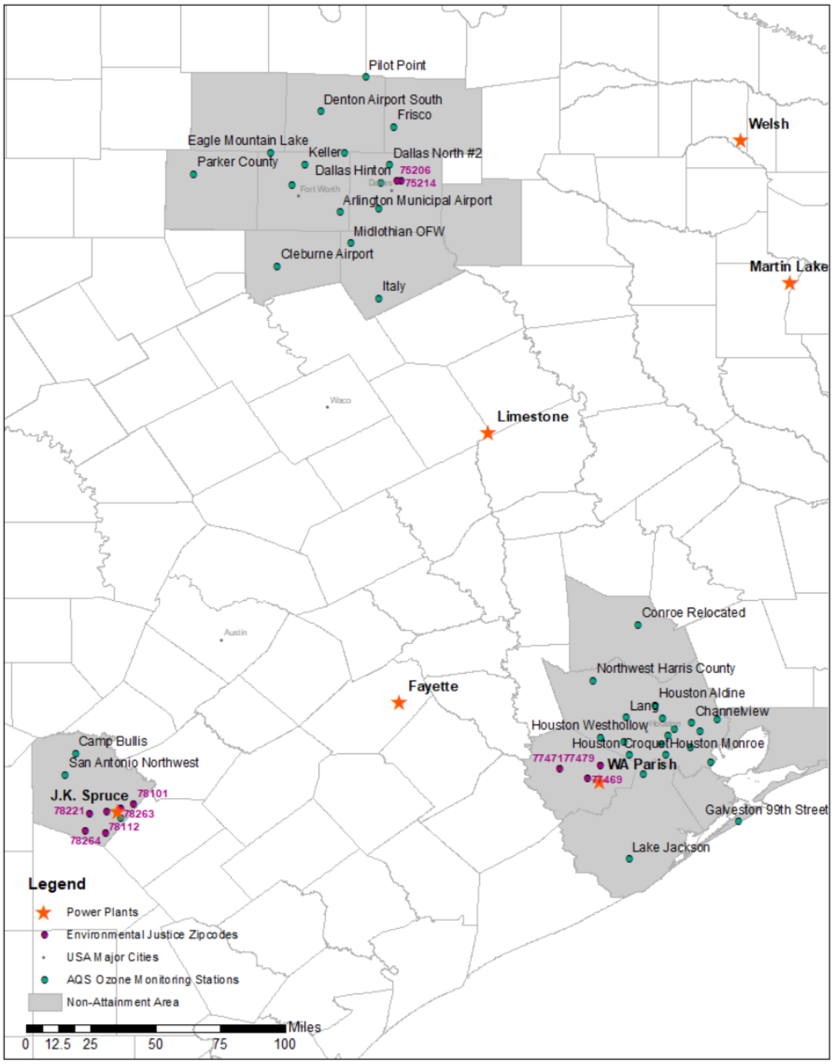


Figure 3. Facility locations with AQS ozone monitoring stations that exceeded that NAAQS and EJ zip codes located in 2015 ozone moderate nonattainment areas.

TCEQ's proposed Bexar RACT SIP appears to incorrectly presume that consistency with recommended controls in a CTG or ACT constitutes RACT compliance.[52] However, EPA has long maintained the position that CTG and ACT documents are to be a *starting point* for analysis, and states should consider "all relevant information (including recent technical information and information received during the public comment period) that is available at the time." 80 Fed. Reg. 12,279· TCEQ's Bexar RACT SIP fails to meet the Clean Air Act's RACT

[52] RACT Analysis at 7.

requirements because it proposes only existing RACT controls without rationally evaluating additional measures that could reduce emissions in the Bexar County area. Instead of "determin[ing] whether the existing controls or emissions reduction approach at [existing] source[s] can be updated or improved with reasonably available controls or strategies to achieve increased levels of emission reduction," 81 Fed. Reg. 58,010, 58,037 (Aug. 24, 2016), Texas reflexively and arbitrarily relies on its existing controls, which are more than a decade old at this point.[53]

TCEQ provides no support for finding that its existing rules—many of which are decades old—continue to satisfy RACT. *See generally* Bexar RACT SIP, App'x A, RACT Analysis. That failure to provide a rational explanation is itself unlawful and arbitrary.

That failure is especially glaring because TCEQ's rules no longer are adequately stringent to satisfy RACT. As discussed below, there are many examples of NOx emission limits adopted as RACT in other states—New York and California (South Coast), in particular—within the past fourteen years for boilers, stationary gas turbines, gas-fired internal combustion engines, and electricity generating units at electricity generating facilities. All four types of sources are present in the Bexar nonattainment area and are subject to TCEQ's comparatively weak NOx emission limits. The other states' emission limits shown here are lower than those TCEQ proposes to maintain, demonstrating that TCEQ can, and indeed must, set lower RACT emission limits for NOx. TCEQ can and must swiftly undertake and complete a similar review to determine what is being done in other states and adjust RACT emission limits for NOx and VOCs downward accordingly. In addition, TCEQ has failed to meet RACT requirements for pesticide application, glass furnaces, and industrial cleaning solvents, as also explained below.

B. TCEQ Must Impose Reasonably Available Control Technology Emission Limits Equivalent To Installation and Efficient Operation of SCR Control Technology at Coal-Burning EGUs in the Bexar County Nonattainment Area.

In its Bexar RACT SIP, TCEQ proposes to apply emission limitations found in 30 T.A.C. Chapter 117 to major sources in Bexar County. For existing coal EGUs, like JK Spruce Unit 1, which are "not controlled with SCR," 30 T.A.C. § 117.1105(a)(4) would require the source to meet a 0.20 lb/MMBtu NOx limit on a rolling 30-day average basis.[54] As discussed below, that determination is unlawful and arbitrary and capricious because coal-burning boilers are routinely capable of achieving lower emissions with the installation and operation of SCR.

Texas must revise the Bexar RACT SIP to require SCR technology as RACT for JK Spruce Unit 1. As noted, EPA has defined RACT as "the lowest emission limitation that a

---

[53] *Sierra Club v. EPA*, 972 F.3d at 302.

[54] Bexar RACT SIP at 4-4 (incorporating TCEQ, Proposed Revisions to Chapter 117 – Control of Air Pollution from Nitrogen Compounds Rule Project No. 2023-117-117 AI, *available at* https://www.tceq.texas.gov/downloads/rules/current/23117117_pro.pdf); *see id*. at 27 (Proposed 30 T.A.C. § 117.1105(a)(4)).

particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[55] In determining RACT, EPA:

> presumes that *it is reasonable for similar sources to bear similar costs of emission reductions. Economic feasibility rests very little on the ability of a particular source to 'afford' to reduce emissions to the level of similar sources.* Less efficient sources would be rewarded by having to bear lower emission reduction costs if affordability were given high consideration. Rather, economic feasibility for RACT purposes is largely determined by evidence that other sources in a source category have in fact applied the control technology in question.[56]

For coal fired EGUs, SCR controls are technologically and economically feasible. Indeed, SCR controls exist on the majority of coal fired EGUs in the country,[57] including the newer JK Spruce Unit 2 located at the same facility as Unit 1. And it would be arbitrary to allow units that indisputably contribute to nonattainment to bear lower emission costs than their counterparts. EPA itself has recently explained:

> [m]ore than 60% of the existing coal capacity already has [SCR] technology in place. For nearly 25 years, all new coal fired EGUs that commenced construction have had SCR (or equivalent emissions rates).[58]

The Bexar RACT SIP must, at a minimum, impose NOx limits commensurate with SCR installation and optimal operation as RACT for coal fired EGUs. Not only has EPA's existing actions demonstrated that SCR technology is RACT for large coal fired EGUs and the importance of SCR controls to minimize NOx emissions on high electricity demand days, which frequently correlate with the ozone NAAQS exceedance days that drive ongoing nonattainment. But installing SCRs is technologically and economically feasible for coal plants over 100 MW in Texas. Moreover, any RACT rule that Texas imposes must address units with SCRs already installed that fail to run their controls at full efficacy.

1. <u>EPA's Recent Ozone Control Actions Demonstrate that SCR is RACT for Coal-Fired EGUs</u>

The EPA has repeatedly found that SCR control technology is consistent with the definition of RACT for coal-burning EGUs like JK Spruce. This conclusion is reinforced by multiple recent actions. First, in its Good Neighbor Plan,[59] EPA requires SCR retrofits on coal fired EGUs over 100 MW in upwind states that contribute significantly to downwind nonattainment or maintenance issues. In the proposed and final rule, EPA provides numerous arguments that SCR control technology is widely available and implemented as RACT for local

---

[55] 57 Fed. Reg. 55,620, 55,624 (Nov. 25, 1992) (citing 44 Fed. Reg. 53,762 (Sept. 17, 1979)), <u>https://www.regulations.gov/document/EPA-R09-OAR-2016-0215-0012</u>.
[56] 57 Fed. Reg. at 18,074 (emphasis added).
[57] *See supra* Section II.a.
[58] 87 Fed. Reg. at 20,094 (citing 63 Fed. Reg. 57,448; 71 Fed. Reg. 25,345).
[59] 88 Fed. Reg. 36,654 (June 5, 2023).

attainment. The final Good Neighbor Plan likewise found that SCR technology was widely employed by large coal units, and in prior guidance has explained that economic feasibility is determined by whether controls are widespread in the industry. Finally, EPA has approved a number of state RACT regulations requiring NOx emissions levels consistent with SCR installation. Together, these actions demonstrate EPA's position that SCR control technology is RACT, and the Texas SIP revisions must therefore require SCR installation and effective use on coal fired EGUs to reach attainment under the 2015 Ozone NAAQS.

2. The Good Neighbor Plan Demonstrates SCR is RACT for Large Fossil Fuel EGUs.

EPA's Good Neighbor Plan demonstrates that SCR control technology is RACT for fossil fuel EGUs. [60] The rule requires emissions reductions for upwind states "commensurate with the retrofit of SCR at coal steam units of 100 MW or greater capacity … [and] oil/gas steam units greater than 100 MW that have historically emitted at least 150 tons of NOx per ozone season" by the 2026 ozone season.[61] EPA assumes a 0.05 lb/mmBtu emissions rate as a reasonable level of performance for units installing new SCRs for EGUs like JK Spruce Unit 1.[62]

The Good Neighbor Plan rulemaking record compels the conclusion that SCR is also RACT for JK Spruce Unit 1. Specifically, EPA reaffirms its position—previously articulated in the Revised Cross-State Air Pollution Rule Update—that SCR controls are "demonstrated technologies" that are "widely practiced" and "widely available" ozone pollution mitigation strategies "across the EGU fleet."[63] Similarly, the EPA's Cross State Air Pollution rule under the prior 75 ppb ozone standard supports the position that RACT requires implementation of SCR controls. There, the EPA stated that "installing new SCRs" and "[f]ully operating existing SCR" are "widely available" emission controls for EGUs.[64]

In the Good Neighbor Plan, not only did EPA find that over 60 percent of existing coal fired EGU capacity has SCR technology, but the requirement for its implementation is longstanding, going back 25 years:

> The 1997 proposed amendments to subpart Da revised the NOX standard based on the use of SCR. The NOx SIP Call (promulgated in 1998) established emissions reduction requirements premised on extensive SCR installation (142 units) and incentivized well over 40 GWs of SCR retrofit in the ensuing years. Similarly, the Clean Air Interstate Rule established emissions reductions

---

[60] Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard, 87 Fed. Reg. 20036, 20,095 (Apr. 6, 2022), https://www.govinfo.gov/content/pkg/FR-2022-04-06/pdf/2022-04551.pdf.
[61] *Id.* at 20,095.
[62] *Id.* at 20,078, 20,081.
[63] *Id.* at 20,091, 20,094.
[64] Revised Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS, 86 Fed. Reg. 23,054, 23,087 (Apr. 30, 2021), https://www.govinfo.gov/content/pkg/FR-2021-04-30/pdf/2021-05705.pdf.

requirements in 2006 that assumed another 58 units (15 GW) would be installed in the ensuing years among just 10 states, and an even greater volume of capacity chose SCR retrofit measures in the wake of finalizing that action.[65]

The Good Neighbor Plan rulemaking also highlights numerous states' regulatory approaches requiring the adoption of "SCR-based standards as part of stringent NOx control programs" for RACT. In particular, the EPA cited RACT regulations resulting in "remaining coal sources in states along the Northeast Corridor such as Connecticut, Delaware, New Jersey, New York, and Massachusetts all being retrofitted with SCR." [66] The EPA also pointed out SCR installation requirements in Maryland, North Carolina and Colorado.[67] The RACT state regulations are discussed in further detail below.

Because EPA requires SCR-level controls in its ozone transport FIP, it follows that instate RACT controls must be at least as stringent. In the Good Neighbor Plan, EPA states that downwind states must do as much to protect in-state air quality as upwind states do through their good neighbor obligations. Thus, if SCR installation is an appropriate good neighbor control for upwind sources, it follows that this is a reasonably available control technology for similar in-state sources. EPA expressly stated that in determining which upwind emissions are contributing to downwind nonattainment, "EPA assumes that the downwind state will implement (if it has not already) an emissions control stringency for its sources that is comparable to the upwind control stringency identified [in the rule]."[68] EPA also reiterated its long-standing assumption that downwind states "will make similar reductions as those assumed in [this rule] for purposes of local attainment."[69] Thus, the EPA's position is that emissions levels must be at least as stringent for downwind states as they are for upwind states. Extending this logic, if SCR retrofitting on coal fired EGUs is required for upwind states, SCR implementation is necessarily also required for local attainment according to the EPA.

3. Numerous States Have Implemented SCR-Level NOx Emissions Limits with EPA Approval.

Numerous state regulations have imposed NOx emissions limits that are consistent with implementation of SCR control technology for coal-burning boilers. For example, Delaware limits NOx emissions to 0.125 lb/mmbtu, demonstrated on a rolling 24-hour average basis.[70] New Jersey's state regulations limit NOx emissions 1.5 lb/MWh demonstrated on a 24-hour

---

[65] 87 Fed. Reg. at 20,094 (citing 63 Fed. Reg. 57,448; 71 Fed. Reg. 25,345).

[66] *Id.* (citing EPA–HQ–OAR–2020–0272, Comment letter from Attorneys General of NY, NJ, CT, DE, MA).

[67] *Id.* (citing COMAR 26.11.38 (control of NOX Emissions from Coal-Fired Electric Generating Units); https://www.epa.gov/system/files/documents/2021-09/table-3-30-state-power-sector-regulations-included-in-epa-platform-v6-summer-2021-refe.pdf).

[68] 87 Fed. Reg. at 20,092 (emphasis added).

[69] *Id.* at 20,099, n.206.

[70] 7 Del. Admin. Code 1146 § 4.3. This regulation applies to coal fired and residual oil-fired electric generating units located in Delaware with a nameplate capacity rating of 25 MW or greater. 7 Del. Admin. Code 1146 § 2.0. For EPA approval, see 73 Fed. Reg. 50,0723 (Aug. 28, 2008); 75 Fed. Reg. 48,566 (Aug. 11, 2010).

average basis between May and September, and on a 30-day average basis between October and April.[71] Connecticut limits NOx emissions from coal fired EGUs to 0.12 lb/mmbtu, based on a daily block average during the ozone season .[72] In New York the one-hour average emissions limit is between 0.08 lb/mmbtu and 0.12 lb/mmbtu for most types of coal units.[73] In Maryland, the 30-day system wide rolling average NOx emissions cannot exceed 0.15 lbs/mmbtu.[74] The state attorneys general for New York, New Jersey, Connecticut, Delaware, and Massachusetts have argued to the EPA and the EPA has itself claimed that these emissions limits represent "stringent Reasonably Available Control Technology on all major NOx … stationary sources."[75] As a result of the stringent NOx emissions approved by the EPA, a number of units in Delaware, Maryland, and New York have assessed investment in SCRs, and in the case of Indian River Unit 4, installed SCR controls.[76] Through its approval of these emissions limits, EPA has determined that NOx emissions levels requiring SCR control technology are RACT.

---

[71] N.J. Admin. Code § 7:27-19.4(a), 19.15(a). For EPA approval, see 83 Fed. Reg. 50,506 (Oct. 9, 2018).

[72] Regs. Conn. State Agencies § 22a-174-22e(d)(2)(C). For EPA approval, see 86 Fed. Reg. 37,053 (July 14, 2021); 82 Fed. Reg. 35454 (July 31, 2017)s; 82 Fed. Reg. 59,519 (Dec. 15, 2017).

[73] 6 N.Y.C.R.R. Part 227-2.4. For EPA approval, see 86 Fed. Reg. 54,375 (Oct. 1, 2021); 78 Fed. Reg. 41,846 (July 12, 2013).

[74] Md. COMAR 26.11.38.03B(1). The regulations also required seven units to choose between (1) installing and operating an SCR control system and meeting a NOx emission rate of 0.09lbs/MMBtu on a 30-day average; (2) permanently retiring the unit, (3) permanently switching from coal to natural gas fuel, (4) or meeting either a NO_x emission rate of 0.13 lbs/MMBtu as determined on a 24-hour systemwide block average or a systemwide NO_x tonnage cap of 21 tons per day during the ozone season, by June 1, 2020. *Id.* at 26.11.38.03(C)(2). For EPA approval, see 82 Fed. Reg. 24,546 (May 30, 2017). Maryland's most recent RACT SIP from August 2020 stated that "COMAR 26.11.38 contains stringent NOx control requirements for certain coal fired EGUs that MDE determined represents NOx RACT level of control." State of Maryland 0.070 ppm 8-Hour Ozone Reasonably Available Control Technology (RACT) State Implementation Plan, SIP Number: 20-11, at 25, (Aug. 10, 2020) https://mde.maryland.gov/programs/air/AirQualityPlanning/Documents/SIPDocuments/OzoneRact/OzoneRACT2015.pdf.

[75] Comments of the Attorneys General of New York, New Jersey, Connecticut, Delaware, and Massachusetts, and the Corporation Counsel of the City of New York 6 (Dec. 14, 2020); 87 Fed. Reg. at 20,094 (citing the comment letter).

[76] *See id.* (describing settlement agreement for C.P. Crane retirement); *see also* MDE Technical Support Document Regarding the Designation of the Area of the Herbert A. Wagner Generating Plant for 1-Hour Sulfur Dioxide at 1, https://www.epa.gov/sites/default/files/2016-04/documents/md-remarks-att1-r2.pdf (Apr. 2016) ("New MDE nitrogen oxide (NOx) regulations (COMAR 26.11.38) that became effective on May 1, 2015, are also pushing changes that will reduce SO2 emissions at the coal fired electricity generating units in the Wagner area. By 2020, both of the coal fired units at the C.P. Crane Generating Station (Crane) are required to convert to natural gas or retire, while Wagner's Unit 2 is expected to convert to natural gas or retire."); DNREC, State Implementation Plan Revision to Address the Clean Air Act Section 110

4. Implementing SCRs as RACT is Economically and Technologically Feasible in Texas.

Installing SCRs at coal-burning EGUs, like JK Spruce Unit 1, is both economically and technologically feasible and is therefore required RACT. Technological feasibility is undisputed and readily established by the widespread implementation of SCRs recognized by the EPA, as described above.[77] SCRs are economically feasible for coal fired EGUs in Texas using both a source category analysis and considering cost per ton. Again, the economic feasibility of RACT "rests very little on the ability of a particular source to 'afford' to reduce emissions to the level of similar sources" and instead turns on whether other sources in that category have applied the control technology.[78] From this perspective, SCRs are economically feasible considering the number of coal fired EGUs that have applied SCRs nationwide and EPA's own findings that SCRs are widely available.

EPA has also considered cost per ton of NOx emissions reductions and determined that installation of new SCRs at a cost of $11,000 per ton of emissions reductions is cost effective and economically feasible.[79] In particular, in the proposed cross-state air pollution rule, EPA provided that coal fired EGUs over 100 MW must install SCR controls and estimated that installation of new SCRs costs $11,000 per ton.[80] Moreover, other states have adopted regulations requiring SCR-level NOx emissions limits while estimating much higher cost per ton of NOx emissions. Connecticut's NOx emissions control program is based on a control stringency of $13,635 per ton of NOx emissions reductions.[81] New Jersey found that controls for oil-fired boilers up to $18,000 per ton, and up to $18,983 per ton for SCRs for gas turbines are cost effective and reasonably available.[82] Thus, EPA's $11,000 cost per ton benchmark for cost

---

Infrastructure Elements for the 2008 Ozone National Ambient Air Quality Standard (NAAQS) (July 2012), https://regulations.delaware.gov/register/july2012/general/16%20DE%20Reg%20114%2007-01-12.pdf ("Unit 4 has installed SCR technology and is subject to a NOx limitation of 0.1 llb/mmBTU, 24-hour average, under 7 DE Admin Code 1146, and an associated consent order."); DEC Air Title V Facility Permit to Cayuga Operating Company LLC, Facility DEC ID 7503200019, at 85-86 (permit effective Jan. 29, 2015) https://www.dec.ny.gov/dardata/boss/afs/permits/750320001900016_r2.pdf. The permit states that these options are required pursuant to 6 N.Y.C.R.R. Part 227-2.5, the regulation describing compliance options for NOx RACT. *Id*.

[77] *See supra*, Sections II.a, III.a.

[78] 57 Fed. Reg. at 18,074 (emphasis added).

[79] 87 Fed. Reg. 20,036, 20,081 (Apr. 6, 2022), https://www.govinfo.gov/content/pkg/FR-2022-04-06/pdf/2022-04551.pdf.

[80] *Id*.

[81] Regs. Conn. State Agencies § 22a-174-22e(h)(1)(A)(iii).

[82] NJ DEP, State Implementation Plan Revision for Infrastructure and Transport Requirements for the 70 ppb and 75 ppb 8-hour Ozone NAAQS and Negative Declaration for the Oil and Natural Gas Control Technique Guidelines 15 (May 2019), https://dep.nj.gov/wp-content/uploads/airplanning/InfraTransportSIP2019-FinalSIP.pdf.

effectiveness is well within the parameters that states have set for economic feasibility of control technologies.

Sierra Club retained Ron Sahu, an engineer with expertise in controls on coal fired EGUs, to conduct an analysis of the cost effectiveness of SCR installation on coal fired EGUs in Texas, including JK Spruce. As explained in his attached report, Dr. Sahu concludes that it is economically feasible for JK Spruce Unit 1 to install SCR, even using the EPA's conservative Good Neighbor Plan benchmark of $11,000 cost per ton of NOx emissions reductions. Specifically, Dr. Sahu found that installation of SCR control technology at JK Spruce Unit 1 would cost approximately $9,255 per ton of NOx removed, well below EPA's $11,000 per ton threshold:[83]

SCR Cost Effectiveness Analysis for JK Spruce

Plant	Unit	Unit Size (MW)	Median NOx[84]	SCREff	Post SCR NOx	SCR Cost Effectiveness[85]	Capacity Factor[86]
JK Spruce	1	556	0.146	70	0.044	$9,255	69.5

That SCR cannot be installed by the RACT implementation deadline does not preclude implementation of the technology. As TCEQ has recognized, unlike RACM, which the agency interprets as requiring that the measure "advance attainment of the area towards the meeting the NAAQ" by the attainment deadline, "[a]dvancing attainment of the area is not a factor of consideration when evaluating RACT because the benefit of implementing RACT is presumed."[87] In any event, to ensure the installation of RACT and attainment of the NAAQS as "expeditiously as practicable," Texas should require installation of SCRs by "the earliest [] attainment date by which the required emissions reductions from these strategies are possible."[88]

As Dr. Sahu identifies in his report, there are multiple regulatory and industry authorities indicating that SCRs can be installed in as few as 21 months for individual units. [89] There is

[83] Ex. 2, Dr. Ranjit Sahu, *Analysis of NOx Emissions for Selected Coal-Fired Units*.
[84] 2018-September 2022 Monthly NOx (lb/MMBtu).
[85] SCR Cost Effectiveness, $/ton.
[86] Maximum of: Median Monthly 2017-2021 or Jan-Oct 2022.
[87] Bexar RACT SIP at 4-5.
[88] 87 Fed. Reg. 20,099 ("Additional emissions reductions that the EPA finds not possible to implement by [the] attainment date are proposed to take effect as expeditiously as practicable, with the full suite of emissions reductions taking effect by the 2026 ozone season, which is aligned with the August 3, 2027, attainment date for
areas classified as Serious nonattainment under the 2015 ozone NAAQS.").
[89] Sahu Report, Ex. 2 at 4-5.

therefore plenty of time for Texas's EGUs to install SCRs to meet RACT implementation deadlines.

5. <u>Texas Must Require JK Spruce Unit 2 to Operate its SCR System More Effectively.</u>

For coal fired EGUs with SCR control technology already installed, like JK Spruce Unit 2, Texas must impose NOx RACT limits in its SIP that are commensurate with optimal usage of SCRs consistent with manufacturer specifications and good engineering practices. Doing so will ensure that NOx emissions in practice are consistent with the lowest demonstrated NOx reduction efficacies of existing SCRs at each unit.

In the Bexar RACT SIP, TCEQ also proposes to require utility boilers with SCR technology already installed to operate a 0.069 lb/MMBtu NOx rate on a rolling 30-day average basis.[90] The SIP does not explain, however, why that limit is RACT for JK Spruce Unit 2, especially when EPA's Clean Air Markets Database demonstrates that the unit can and has regularly met lower emissions rates with the SCRs already installed. Indeed, EPA data in the table below indicates, other Texas EGUs with SCR are routinely able to meet emission rates lower than 0.069 lb/MMBTU. Moreover, the data shows that JK Spruce Unit 2 itself is capable of achieving as low as a 0.03 lb/MMBTU limit on a 30-day rolling basis.

Emission Rates at JK Spruce Unit 2 with SCR Ins[91]

Facility	Unit	Year Online	Nameplate Capacity (MW)	N0x Controls	SCR?	2022 Total NOx Tons	2022 Ozone Season Avg NOx Rate (lbs/MMBtu)	2022 Avg Annual NOx Rate (lbs/MMBtu)	Period of Lowest 30 Day Avg NOx Rate (Units with SCR)	Lowest 30 Day Avg NOx Rate (lbs/MMBtu) (Units with SCR)	2022 Avg Annual Rate is __% of Lowest 30 Day Rate (Units with SCR)	Operating Within 25% of Lowest Dem. Rate? (Units with SCR)
J K Spruce	2	2010	878	LNB,	SCR	944.799	0.0472	0.0457	Dec-20	0.0313	146%	NO

[90] Bexar RACT SIP at 4-4 (incorporating TCEQ, Proposed Revisions to Chapter 117 – Control of Air Pollution from Nitrogen Compounds Rule Project No. 2023-117-117 AI, *available at* https://www.tceq.texas.gov/downloads/rules/current/23117117_pro.pdf); *see id*. at 27 (Proposed 30 T.A.C. § 117.1105(a)(3)).

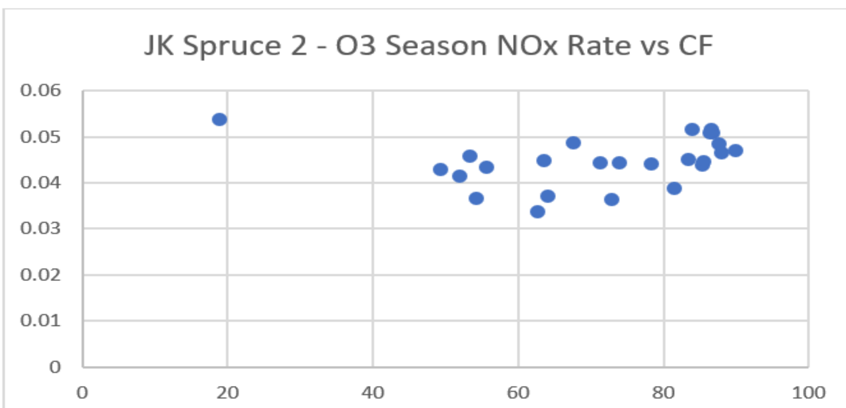
[91] *See S&P Capital IQ Pro*, S&P Global, (last accessed Dec. 3, 2022), https://www.marketplace.spglobal.com/en/datasets/snl-energy-(9); *CAMPD Power Plant Emissions, Compliance, and Allowance Data*, EPA (last accessed Feb. 10, 2023), https://campd.epa.gov. The lowest 30 day average NOx rate was calculated by dividing the sum mass of a unit's monthly NOx emissions by its sum monthly heat input from October 2017 to October 2022. The lowest was then identified and compared to its 2022 average annual NOx rate to determine the consistency and efficacy of its SCR controls.

				OFA								
Oak Grove	1	2010	917	LNB, OFA	SCR	2297.183	0.0719	0.0726	Apr-22	0.0651	112%	YES
Oak Grove	2	2011	879	LNB, OFA	SCR	2294.112	0.0716	0.0723	Feb-22	0.069	105%	YES
Sandy Creek Energy Station	1	2013	1008	LNB, OFA	SCR	1249.286	0.0562	0.0537	Dec-21	0.0395	136%	NO
W A Parish	5	1977	734	LNB, OFA	SCR	1180.253	0.0635	0.0645	Apr-20	0.0499	129%	NO
W A Parish	6	1978	734	LNB, OFA	SCR	1285.15	0.0641	0.0632	Mar-18	0.047	134%	NO
W A Parish	7	1980	515	LNB, OFA	SCR	957.878	0.0578	0.0643	Nov-18	0.04	161%	NO
W A Parish	8	1982	654	LNB, OFA	SCR	384.467	0.0502	0.0585	Apr-19	0.0388	151%	NO

The following tables, excerpted from the Sahu Report, make clear that JK Spruce 2 is simply not operating its SCR consistent with the lowest demonstrated monthly NOx rates. In fact, TCEQ's proposed 0.069 lb/MMBTU RACT emission rate for JK Spruce Unit 2 fails to reflect the "the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[92] Instead, according to Dr. Sahu's analysis, that limit reflects the *highest* rate that the unit achieves. That is not RACT, and it would be arbitrary and unlawful to finalize such a limit. The Sahu Report and Exhibit 3 provide a more comprehensive analysis of Texas EGUs NOx rates that indicate that JK Spruce is not properly utilizing its SCRs. Nor is the poor NOx reduction of the SCRs a product of low capacity factor and minimum operating temperatures, as reflected in the comparisons of capacity factors and NOx rates excerpted below and included in both the Sahu Report and Exhibit 3.

JK Spruce Unit 2

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
JK Spruce	2	878	0.0313	0.0695	0.0537



Accordingly, Texas must revisit its RACT limit for utility boilers in Bexar County with SCR, and ensure that those limits reflect the emission rates that JK Spruce Unit 2 is actually capable of achieving on a regular basis.

[92] Memorandum from R. Strelow, Asst. Adm'r, EPA, Office or Air and Waste Management, to Reg'l Adm'rs, EPA Regions I-X, re: Guidance for Determining Acceptability of SIP Regulations in Non-Attainment Areas at 2 (Dec. 9, 1976) [hereinafter "Strelow Memo"].

C. TCEQ Fails to Establish RACT for Gas-Burning Electric Generating Units.

TCEQ established its still-governing RACT rules, which set various emission limits for NOx, depending on the type of unit and fuel(s) used. 30 T.A.C. § 117.1205; *see also id.* § 117.1210. These 17-year-old requirements must be updated.

On January 7, 2022, South Coast proposed to amend its requirements for electricity generating facilities (EGF), over a 60-minute rolling average. SCAQMD Proposed Rule 1135(d)(1), last amended Jan. 7, 2022.

South Coast – Electricity Generating Units at EGFs

Electric generating units at EGFs	SCAQMD Emission limit	Emission limit unit	Reg
Boiler	5	ppmv, 3% O_2 dry	Proposed SCAQMD R. 1135(d)(1)
	0.0061	lb. NOx/MMBtu	
Combined cycle gas turbine and associated duct burner	2	ppmv, 15% O_2 dry	Proposed SCAQMD R. 1135(d)(1)
	0.0074	lb. NOx/MMBtu	
Simple cycle gas turbine	2.5	ppmv, 15% O_2 dry	Proposed SCAQMD R. 1135(d)(1)
	0.0092	lb. NOx/MMBtu	

South Coast's limits provide a good model for what RACT is possible in Bexar County.

D. TCEQ Fails to Establish RACT for Gas-Fired Boilers and Process Heaters

TCEQ's Bexar RACT SIP proposes to extend the NOx emission limits found in 30 T.A.C. Chapter 117 to "all major sources in Bexar County," which is defined as sources emitting more than 100 tpy NO_X.[93] For low heat release gas-fired boilers in that group, NOx emission limits range from 0.10-0.20 lb. NOx/MMBtu of heat input, depending on whether there is preheated air and the temperature of the preheated air.[94] Similarly, the limits for gas-fired process heaters range from 0.10-0.18 lb. NOx/MMBtu of heat input depending on either preheated air temperature or firebox temperature.[95] High heat release boilers are limited to 0.20-0.28 lb./MMBtu of heat input depending on the temperature of the preheated air.[96]

By contrast, other states/districts have more stringent emissions limitations on gas-fired boilers and process heaters. The South Coast Air Quality Management District ("South Coast" or "SCAQMD") applies a NOx emission limit of 30 ppm for all industrial and commercial boilers, steam generators, and process heaters with greater than or equal to 5 MMBtu/hour rated heat input capacity that burn gaseous fuel, at 3 percent volume stack gas oxygen (O_2). SCAQMD Rule 1146(c)(1)(A), last amended Dec. 4, 2020. Converting 30 ppmv to the units the TCEQ presents its emission limits in, lbs. NOx/MMBtu, results in a comparison value of 0.0365 lb. NOx/MMBtu far lower than even the lowest TCEQ limit for gas-fired boilers, 0.10 lb. NOx/MMBtu, and drastically lower than the highest limit for the hottest high-heat gas-fired boiler of 0.28 lb. NOx/MMBtu.

The 30 ppm (0.036 lb./MMBtu) emission limit on boilers having 5 MMBtu/hour or more heat input capacity appears to act as a ceiling, with the limit lowered down to 5 ppm, or 0.0062 lb. NOx/MMBtu, for the largest category of boilers. South Coast's NOx emission limits for its largest gas-fired boilers (greater than or equal to 75 MMBtu/hour) is two orders of magnitude lower than TCEQ's limits for gas-fired boilers and process heaters, proving that there is ample room for control technology improvements even for the largest boilers and process heaters. Additionally, TCEQ sets no RACT emission limits at all for gas-fired boilers and process heaters with less than 100 MMBtu/hour heat input capacity. South Coast's inclusion of NOx emission limitations for boilers and process heaters with 5 to 99 MMBtu/hour heat input capacity demonstrates that NOx emission limits for this subset of gas-fired boilers and process heaters are consistent with, and thus required by, RACT, at least to the extent those sources are major. TCEQ must include limits for similarly-rated boilers and process heaters at major sources in its SIP.

South Coast - Gas-Fired Boilers and Process Heaters

Boiler/process heater type	SCAQMD Emission limits	Emission limit unit	Reg
	30	ppm	

[93] Bexar RACT Analysis at 8; *see also* 30 T.A.C. § 117.305(b).

[94] *See, e.g.*, 30 T.A.C. § 117.405(b)(1).

[95] 30 T.A.C. § 117.405(b)(2).

[96] 30 T.A.C. § 117.405(b)(1).

Industrial, institutional, and commercial boilers, steam generators, and process heaters ≥ 5 MMBtu/hr, gas-fired	0.036	lb. NOx/MMBtu	SCAQMD R. 1146(c)(1)(A)
Industrial, institutional, and commercial boilers, steam generators, and process heaters ≥ 75 MMBtu/hr, natural gas-fired* (“Group I”)	5	ppm	SCAQMD R. 1146(c)(1)(F)
	0.0062	lb. NOx/MMBtu	
Industrial, institutional, and commercial boilers, steam generators, and process heaters < 75 and ≥ 20 MMBtu/hr, gas-fired*† (“Group II”)	5-9	ppm	SCAQMD R. 1146(c)(1)(G) -(I)
	0.0062-0.011	lb. NOx/MMBtu	
Industrial, institutional, and commercial boilers, steam generators, and process heaters < 20 and ≥ 5 MMBtu/hr, and all units operated at schools and universities ≥ 5 MMBtu, gas-fired† (“Group III”)	5-7	ppm	SCAQMD R. 1146(c)(1)(J)-(K)
	0.0062-0.0085	lb. NOx/MMBtu	
Industrial, institutional, and commercial boilers, steam generators, and process heaters ≥ 5 MMBtu/hr, landfill gas-fired	25	ppm	SCAQMD R. 1146(c)(1)(C)
Industrial, institutional, and commercial boilers, steam generators, and process heaters ≥ 5 MMBtu/hr, digester gas-fired	15	ppm	SCAQMD R. 1146(c)(1)(D)

* Excludes thermal fluid heaters and units operated at schools and universities.
† Excludes digester and landfill gases.

New York State similarly has more protective RACT NOx emission limits for boilers. 6 CRR-NY 227-2.4, last amended 2010. Limits for boilers fired on gas only range from 0.05 lb. NOx/MMBtu for mid-size boilers to 0.08 lb. NOx/MMBtu for very large boilers lower than the lowest TCEQ standard for gas-fired boilers.

New York State - Gas-Fired Boilers

Boiler/process heater type	NYS Emission limits		Emission limit unit	Reg
Very large boilers	0.08	Gas only	lb. NOx/MMBtu heat input	6 CRR-NY 227-2.4(a)
	0.15-0.20	Gas/oil		
Large boilers	0.06	Gas only	lb. NOx/MMBtu heat input	6 CRR-NY 227-2.4(b)
	0.15	Gas/oil		
Mid-size boilers	0.05	Gas only	lb. NOx/MMBtu heat input	6 CRR-NY 227-2.4(c)
	0.08-0.20	Gas/oil		

In sum, TCEQ’s unexplained proposal continues to set NOx emission limitations only for boilers with a maximum capacity rating of 100 MMBtu/hr or greater, and those standards range from 0.10 to 0.28 lb. NOx/MMBtu heat input. Yet, other states set tighter limits—one to two orders of magnitude lower—on the largest boilers, and, additionally, set limits on smaller boilers for which TCEQ has no NOx emission limits. As New York State and South Coast show and the

Clean Air Act requires, TCEQ can and must tighten its RACT standards for NOx from gas-fired boilers.

E. TCEQ Fails to Establish RACT for Stationary Gas Turbines.

TCEQ's Bexar RACT SIP proposes the "same" stationary gas turbine RACT limits that apply in other nonattainment areas.[97] TCEQ's RACT rules for stationary turbines set an emission limit of 42 parts per million by volume (ppmv) NOx at 15% O2, dry basis, for stationary gas turbines with a megawatt (MW) rating greater than or equal to 10.0 MW. 30 T.A.C. § 117.305(c). Other states, however, have concluded that such sources are capable of achieving lower limits. South Coast, for example, in its Rule 1134, sets limits for all stationary gas turbines, 0.3 MW and larger. SCAQMD Rule 1134(a)-(b), last amended Feb. 4, 2022. The limits for stationary gas turbines in South Coast's jurisdiction range from 2 ppmv to 30 ppmv, as described below. Omitting turbines on the Outer Continental Shelf (obviously not relevant for Bexar County), the highest emission limit is 12.5 ppmv, a limit that is a mere 30% of the 42 ppmv NOx allowed for stationary gas turbines under TCEQ's rules. As with gas-fired boilers, South Coast's RACT emission limits for NOx demonstrate that TCEQ can and must apply limits to smaller turbines. Whereas TCEQ only sets its (inadequately high) emission limits for stationary gas turbines rated 10 MW or greater, South Coast applies its lower standards to any stationary gas turbine 0.3 MW or larger. Again, to the extent such turbines are at major sources in Bexar County, they must be subject to RACT.

South Coast – Stationary Gas Turbines

Stationary gas turbine type	SCAQMD Emission limits	Emission limit unit	Reg
Liquid fuel, turbines located on Outer Continental Shelf	30	ppmv NOx	SCAQMD R. 1134(d)(3)
Natural gas, combined cycle/cogeneration turbine	2	ppmv NOx	SCAQMD R. 1134(d)(3)
Natural gas, simple cycle turbine	2.5	ppmv NOx	SCAQMD R. 1134(d)(3)
Produced gas	9	ppmv NOx	SCAQMD R. 1134(d)(3)
Produced gas, turbines located on Outer Continental Shelf	15	ppmv NOx	SCAQMD R. 1134(d)(3)
Other (includes recuperative gas turbines)	2.5	ppmv NOx	SCAQMD R. 1134(d)(3)

[97] TCEQ, Proposed Revisions to Chapter 117 – Control of Air Pollution from Nitrogen Compounds Rule at 12, Project No. 2023-117-117 AI, *available at* https://www.tceq.texas.gov/downloads/rules/current/23117117_pro.pdf.

F. TCEQ Fails to Establish RACT for Gas-Fired, Stationary, Internal Combustion Engines

TCEQ sets a limit of 2.0 grams NOx per horsepower-hour (g/hp-hr) for gas-fired, rich-burn, stationary, reciprocating internal combustion engines rated 150 horsepower (hp) or greater. New York State, however, limits all natural gas-fired, stationary internal combustion engines with a mechanical output rating of 200 brake hp or greater to 1.5 grams per brake horsepower-hour. 6 CRR-NY 227-2.4(f)(1), last amended 2010. This standard applies to rich-burn engines, which TCEQ's rule covers, and to lean-burn engines, which TCEQ's rule does not cover. New York's standard clearly shows that there is room for TCEQ to tighten its limit for gas-fired, stationary internal combustion engines to keep up with current RACT, as well as to expand the range of internal combustion engines to which the standard applies to encompass both rich- and lean-burn.

New York State – Gas-Fired, Stationary, Internal Combustion Engines

	NYS Emission limit	Emission limit unit	Reg
Natural gas-fired, stationary internal combustion engines, 200 brake hp or greater	1.5	g/hp-hr	6 CRR-NY 227-2.4(f)(1)

G. TCEQ Fails to Establish RACT for Pesticide Applications.

TCEQ alleges that it does not need to demonstrate RACT controlling VOCs in pesticide application because "TCEQ does not regulate the use of agricultural pesticides" and because the relevant ACT guidance for pesticides lacks presumptive controls. See Bexar RACT Analysis at 15, Table A-3. That TCEQ does not regulate the use of pesticides does not obviate the state's obligation under the Clean Air Act to adopt RACT for *all* source categories addressed in CTG or ACT guidance. If this were true, TCEQ could escape RACT requirements by declining to regulate source categories at all, an absurd result. The Clean Air Act's SIP requirements pertain to "States," not specific agencies within states. *See, e.g.*, 42 U.S.C. 7410(a)(1) ("Each State shall ... adopt and submit to the Administrator ... a plan which provides for implementation, maintenance, and enforcement [of a primary NAAQS]"). The responsibility to meet SIP requirements, including RACT requirements, falls upon the state of Texas with its multitude of agencies. Texas Department of Agriculture ("TDA") is the state's lead agency for pesticide regulation and authorized to regulate the use of pesticides, including their concentration and manner of use. Texas Agricultural Code, Section 76.104(b)(2) (allowing TDA to adopt rules regulating the "time, place, manner, method, amount, or concentration of pesticide application"). Therefore, TDA is required to adopt rules regulating VOC emissions from pesticide application.

The lack of presumptive controls in the ACT guidance does not establish that no RACT exists to control VOCs from pesticide application. Various nonattainment areas in California are subject to rules controlling VOC from pesticides as part of their attainment plans, with controls including specific fumigation methods and emissions allowances.[98] TCEQ has made no showing

[98] Reducing VOC Emissions from Field Fumigants, CA Department of Pesticide Regulation, https://www.cdpr.ca.gov/docs/emon/vocs/vocproj/reg_fumigant.htm (last visited Jan. 5, 2024).

that similar controls would not be technologically or economically feasible in the Houston area. The proposal must be amended to include additional provisions applying RACT to control VOC emissions from pesticide application, whether these controls are implemented by TCEQ or TDA. Alternatively, to the extent true, the proposal must be amended with a negative declaration.

IV. CONCLUSION

As explained above, the proposed RACT SIP is fundamentally flawed. TCEQ fails to properly evaluate or impose RACT for any sources in the area, or RACM for out-of-area, but in-state sources. As a result, the proposed SIP revisions cannot be approved by EPA. This failure has real-world impacts. It is unsurprising TCEQ's own modeling and monitoring data make clear that Bexar County will not attain the NAAQS by the required 2024 compliance date. Accordingly, poor air quality in Bexar County will persist, harming Bexar County residents' health and wellbeing.

TCEQ must reevaluate and adopt all reasonably available control technologies. The above examples are not meant to reflect a comprehensive review of Texas's regulations implementing RACT. Rather, they show that additional reductions are reasonably available from at least these source categories. TCEQ must both revise its proposal to implement RACT for these source categories and conduct a thorough evaluation of RACT for all sources that must adopt RACT under the Clean Air Act. It is not enough that existing rules merely comport with decades-old CTG and ACT guidance — where TCEQ believes that existing rules constitute RACT, it must provide justification, not the unsupported assertions it makes in the proposal — that stronger controls are infeasible.

Sincerely,

Joshua Smith
Staff Attorney
Sierra Club
2101 Webster Street, Suite 1300
Oakland, CA 94612

Rodrigo G. Cantú,
TX Bar: 24094581
Earthjustice
845 Texas Ave.,
The Sq. Suite 200
Houston, TX 77002
rcantu@earthjustice.org
281.675.5841

ATTACHMENT 3

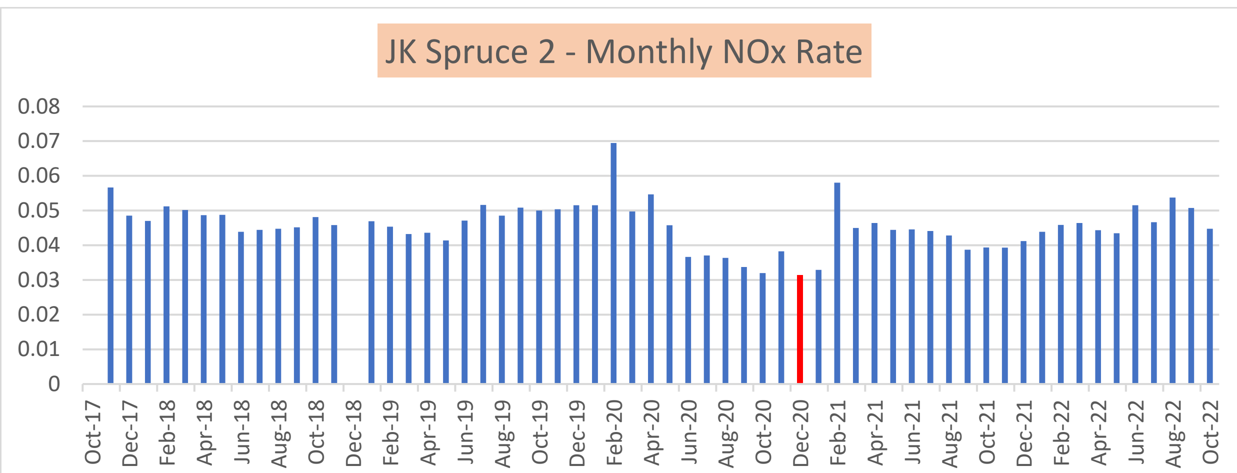
SIERRA CLUB

NOx Emission Rates at Selected Coal Fired Electricity Generating Units with SCR

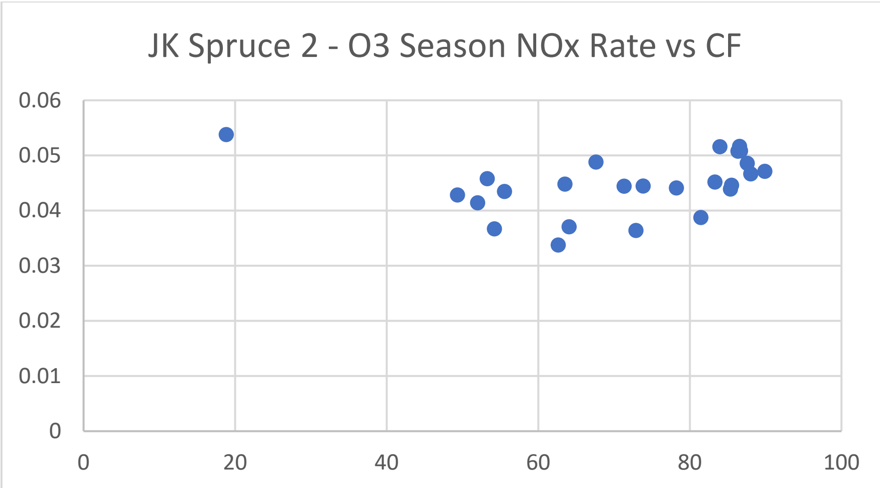
Texas

JK Spruce Unit 2: Unit 2 (878 MW) at the JK Spruce plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates of below 0.04 lb/MMBtu. This unit is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
JK Spruce	2	878	0.0313	0.0695	0.0537

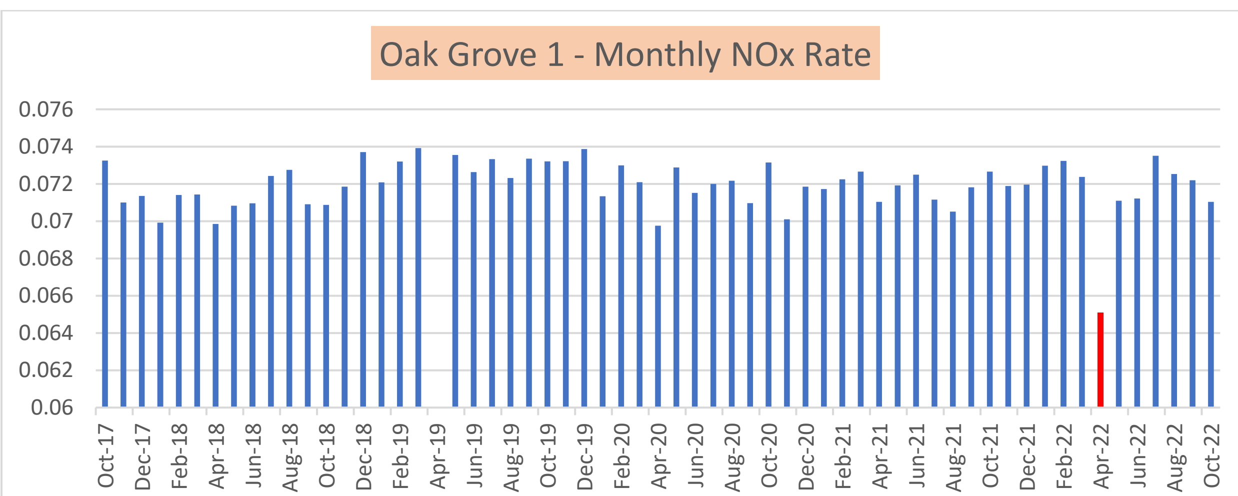


The chart above confirms that JK Spruce Unit 2 has achieved levels below 0.04 lb/MMBtu, with a low of 0.0313 lb/MMBtu, shown in red. The chart below shows that JK Spruce Unit 2 has achieved less than 0.04 lb/MMBtu over a range of ozone-season operating capacity factors.

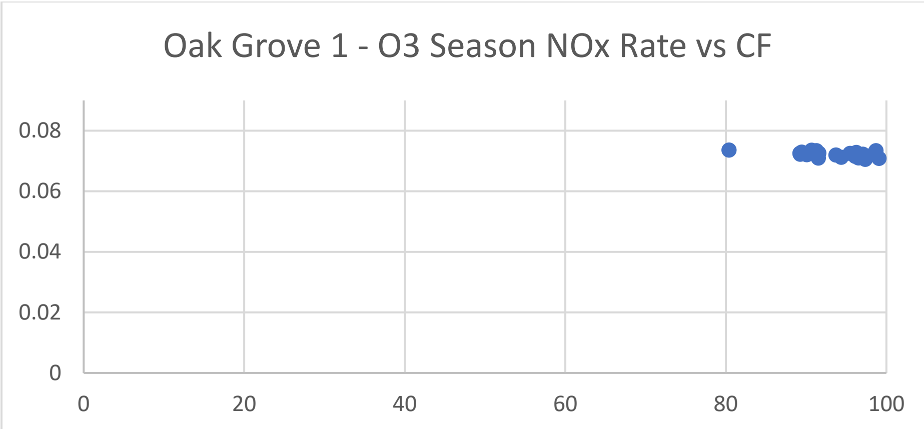


Oak Grove 1: Unit 1 (917 MW) at the Oak Grove plant was analyzed. This unit has SCR installed. It can achieve slightly lower NOx emission rates. It is not operating its SCR consistently according to the SCR's NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Oak Grove	1	917	0.0651	0.0739	0.0736
Oak Grove	2	879	0.0690	0.1117	0.0753

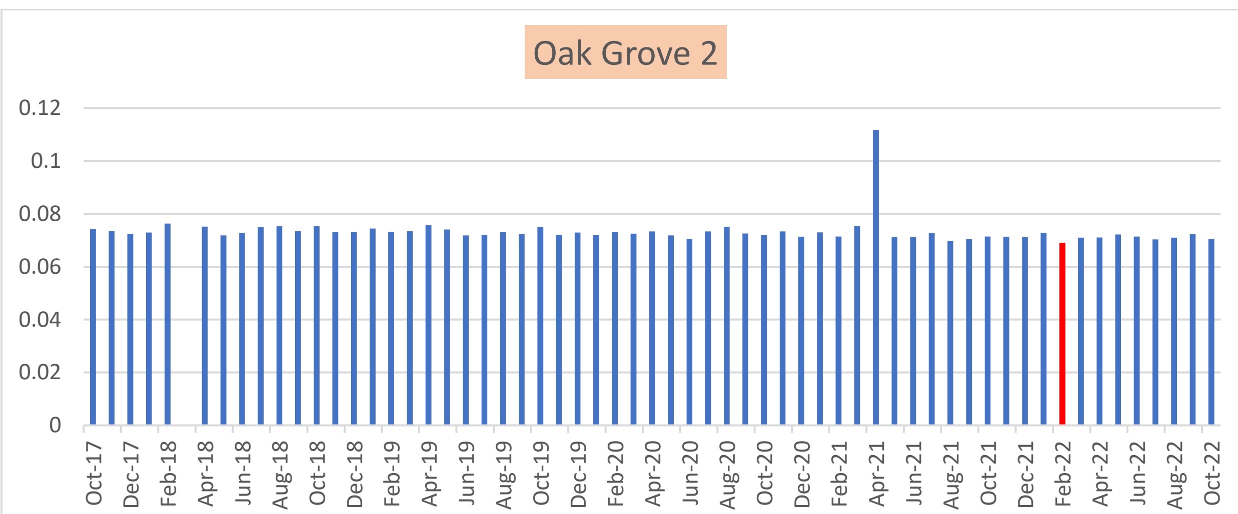


The chart above confirms that Oak Grove Unit 1 has achieved levels below 0.07 lb/MMBtu on several months of recent operation, with a low of 0.0651 lb/MMBtu, shown in red. The chart below shows that Oak Grove Unit 1 has achieved approximately 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

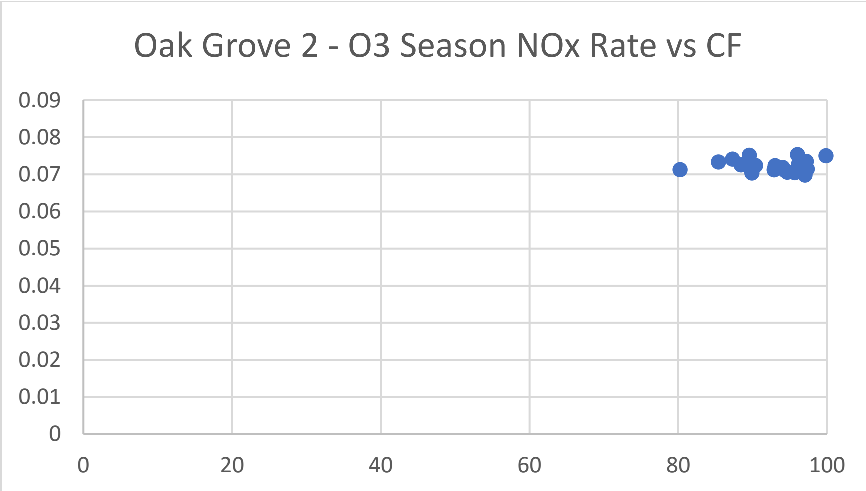


Oak Grove 2: Unit 2 (879 MW) at the Oak Grove plant was analyzed. This unit has SCR installed. It may be able to achieve slightly lower NOx emission rates.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Oak Grove	1	917	0.0651	0.0739	0.0736
Oak Grove	2	879	0.0690	0.1117	0.0753

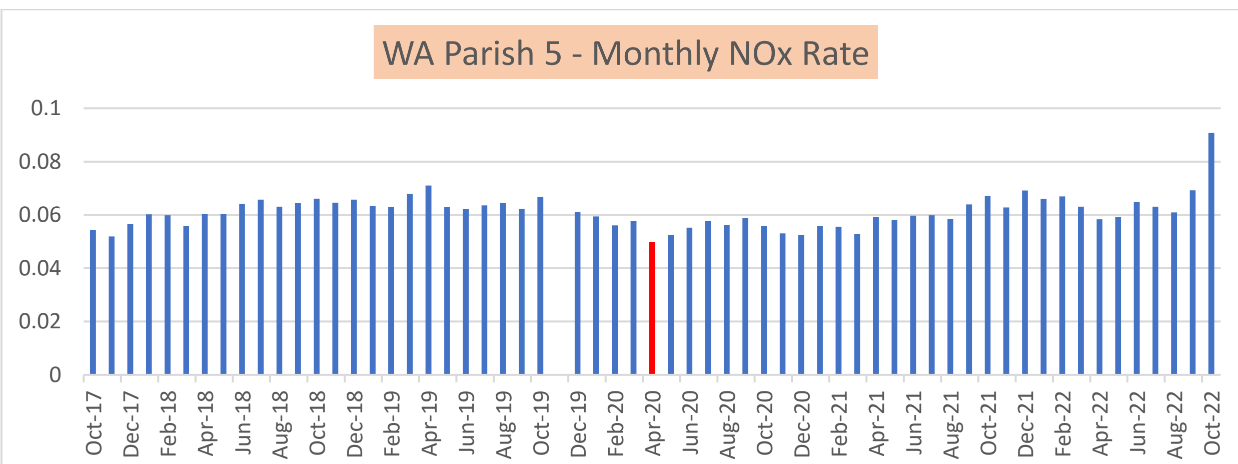


The chart above confirms that Oak Grove Unit 2 regularly achieves NOx emissions rates of approximately 0.07 lb/MMBtu, with a low of 0.0690 lb/MMBtu, shown in red.

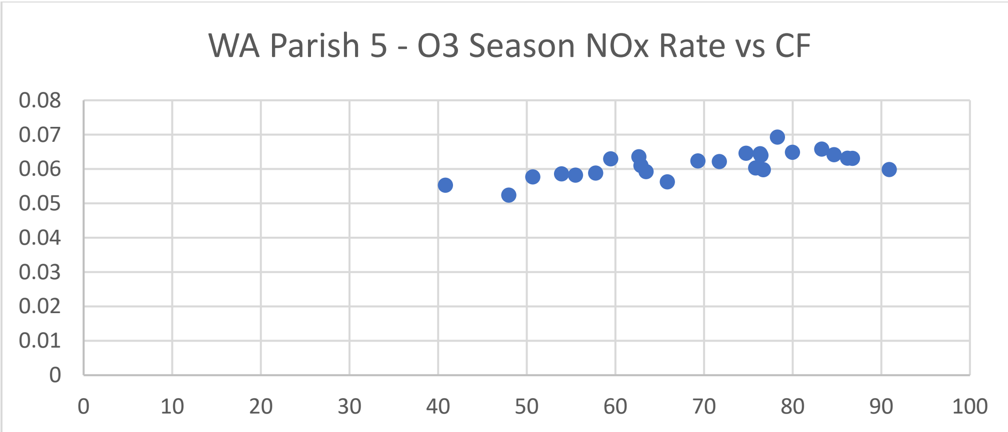


WA Parish Unit 5: Unit 5 (734 MW) at the WA Parish plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.06 lb/MMBtu. It is not operating its SCR consistently in accordance with the lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Parish	5	734	0.0499	0.0908	0.0692

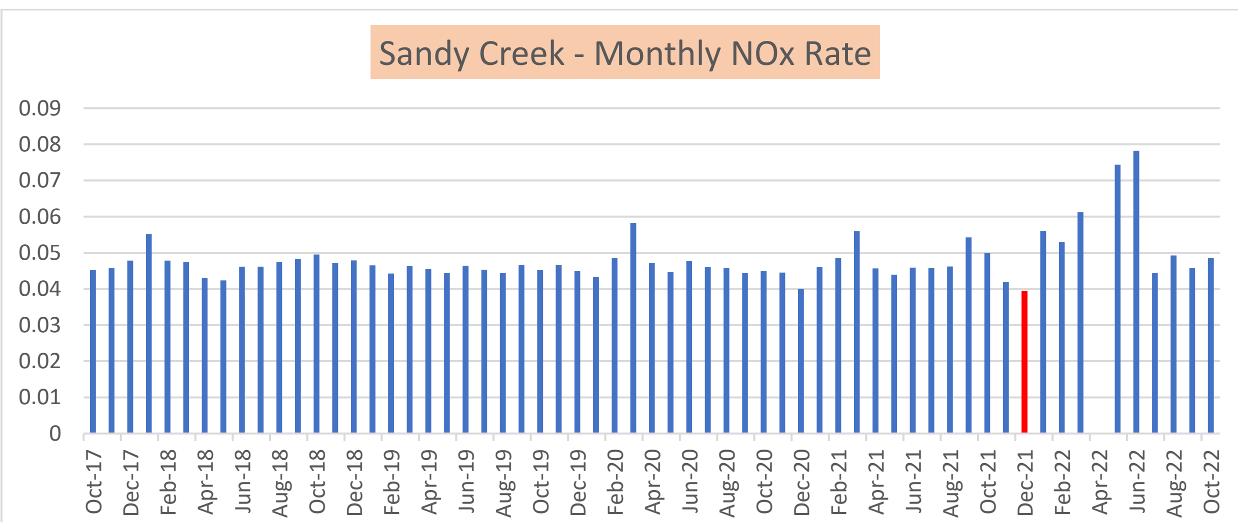


The chart above confirms that WA Parish Unit 5 has achieved levels below 0.06 lb/MMBtu on many months of recent operation, with a low of 0.0499 lb/MMBtu, shown in red. The chart below shows that WA Parish Unit 5 has achieved less than 0.06 lb/MMBtu over a wide range of ozone-season operating capacity factors.

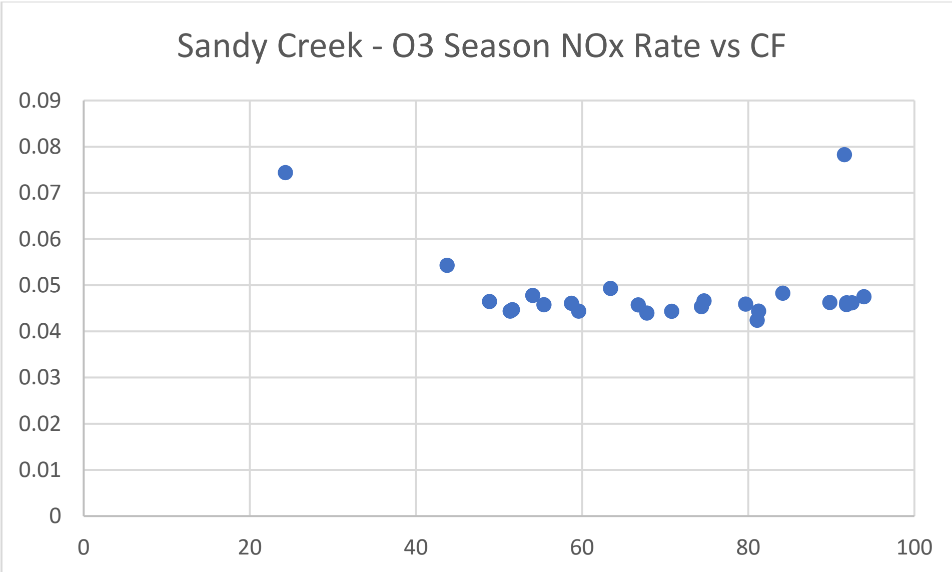


Sandy Creek Unit 1: Sandy Creek Unit 1 (1008 MW) was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Sandy Creek	1	1008	0.0395	0.0782	0.0782



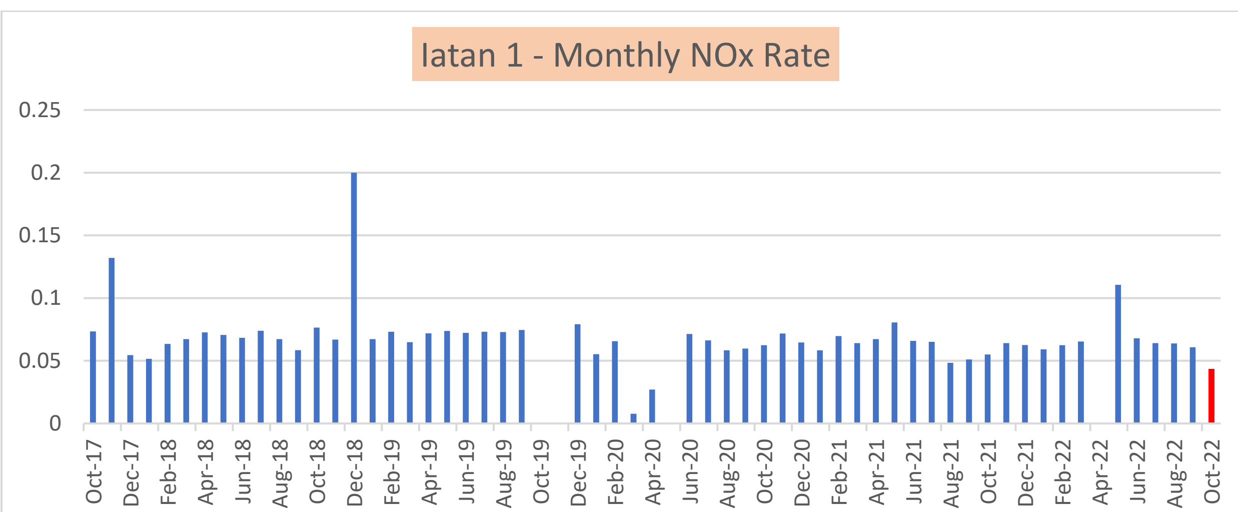
The chart above confirms that Sandy Creek 1 has achieved levels well below 0.05 lb/MMBtu on many months of recent operation, with a low of 0.0395 lb/MMBtu, shown in red. The chart below shows that Sandy Creek 1 has achieved less than 0.05 lb/MMBtu over a wide range of ozone-season operating capacity factors.



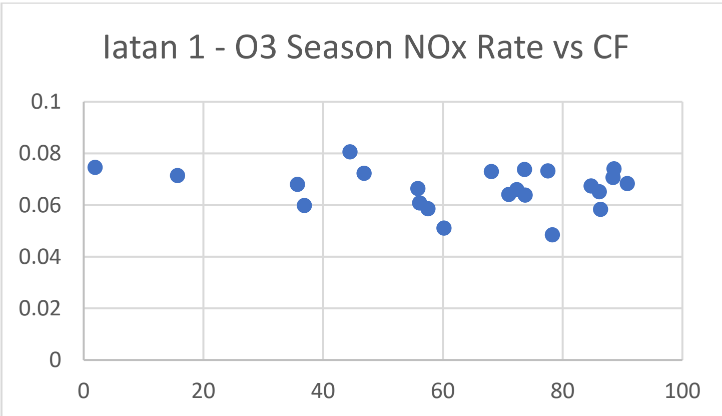
Missouri

Iatan 1: Unit 1 (726 MW) at the Iatan plant was analyzed. This unit has SCR installed. It can achieve reliably lower NOx emission rates below 0.06 lb/MMBtu. It is not operating its SCR consistently in accordance with the SCR's demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Iatan	1	726	0.0435	0.2000	0.0805
Iatan	2	914	0.0454	0.0595	0.0595

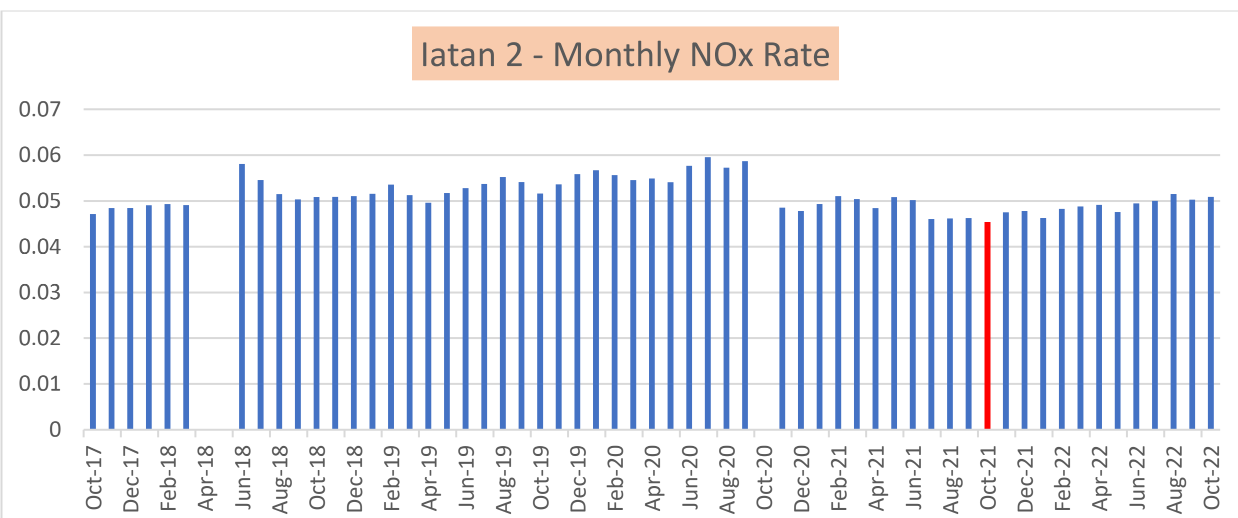


The chart above confirms that Iatan Unit 1 has achieved levels below 0.06 lb/MMBtu on several months of recent operation, with a low of .0435 lb/MMBtu, shown in red. The chart below shows that Iatan Unit 1 has achieved less than 0.06 lb/MMBtu over a wide range of ozone-season operating capacity factors.

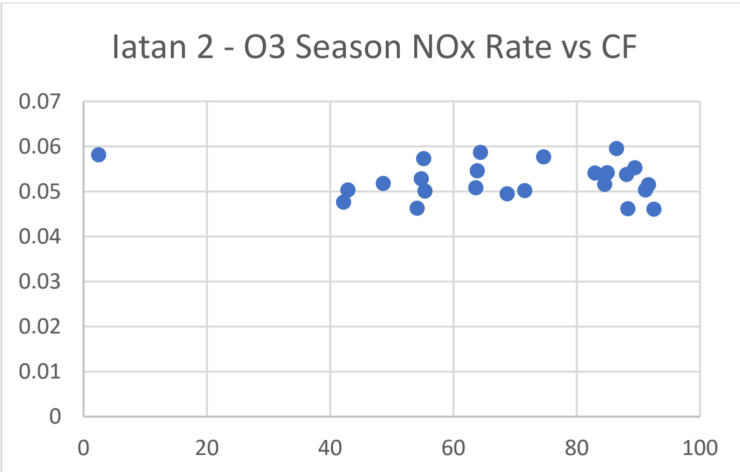


Iatan 2: Unit 2 (914 MW) at the Iatan plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu and has consistently done so from November 2020 through July 2022 excepting two months. It is not operating its SCR consistently in accordance with the SCR's lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Iatan	1	726	0.0435	0.2000	0.0805
Iatan	2	914	0.0454	0.0595	0.0595

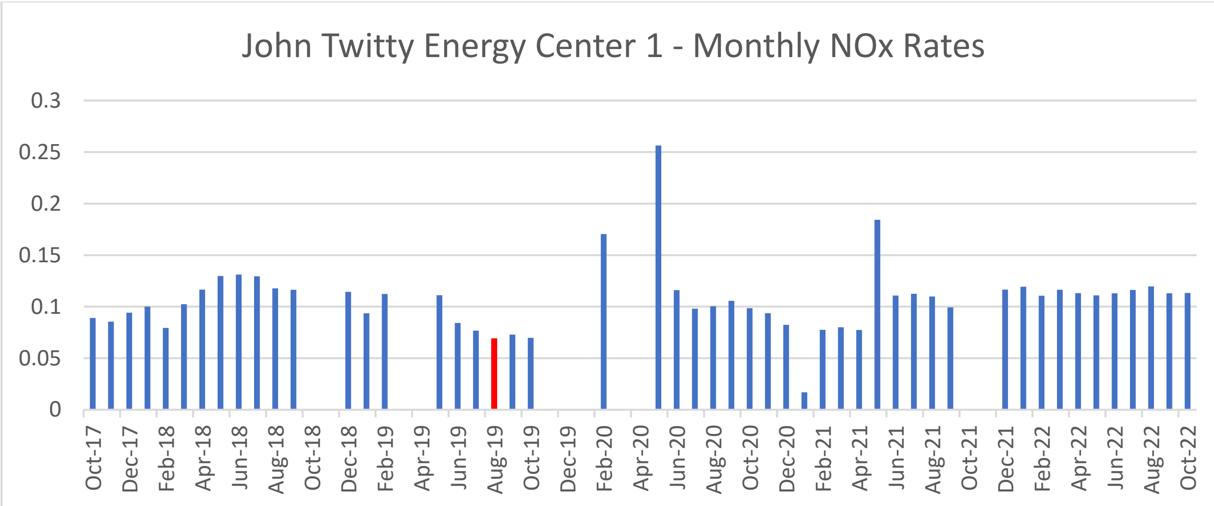


The chart above confirms that Iatan Unit 2 has achieved levels below 0.05 lb/MMBtu on many months of recent operation, with a low of 0.0454 lb/MMBtu, shown in red. The chart below shows that Iatan Unit 2 has achieved less than 0.05 lb/MMBtu over a wide range of ozone-season operating capacity factors.

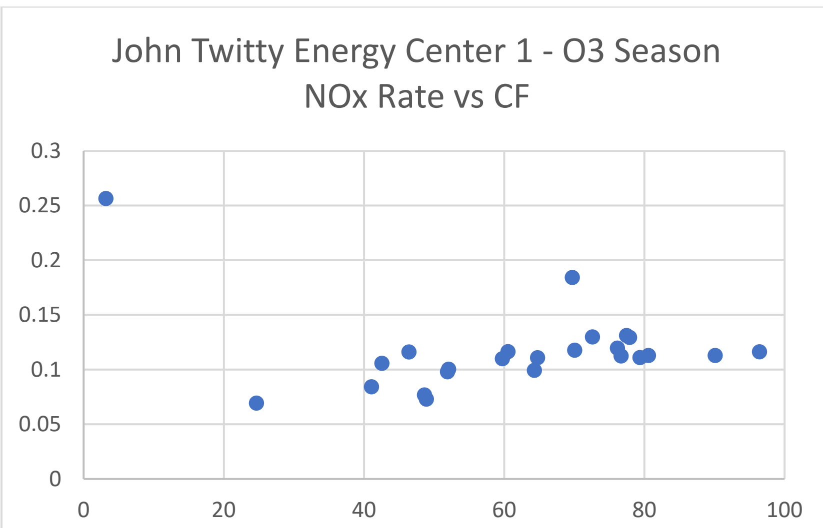


JTEC 1: Unit 1 (194 MW) at the John Twitty Energy Center plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.08 lb/MMBtu as demonstrated by its operation in 2019. It has wildly variable monthly NOx emission rates, ranging from above 0.25 lb/MMBtu at a high to 0.069 lb/MMBtu at a low. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. Indeed, it reliably emitted above 0.1 lb/MMBtu in late 2021 and 2022, significantly above its lowest demonstrated NOx reduction capacity achieved in 2019 of below 0.08 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
John Twitty Energy Center	1	194	0.0693	0.2564	
John Twitty Energy Center	2	300	0.0637	0.0899	

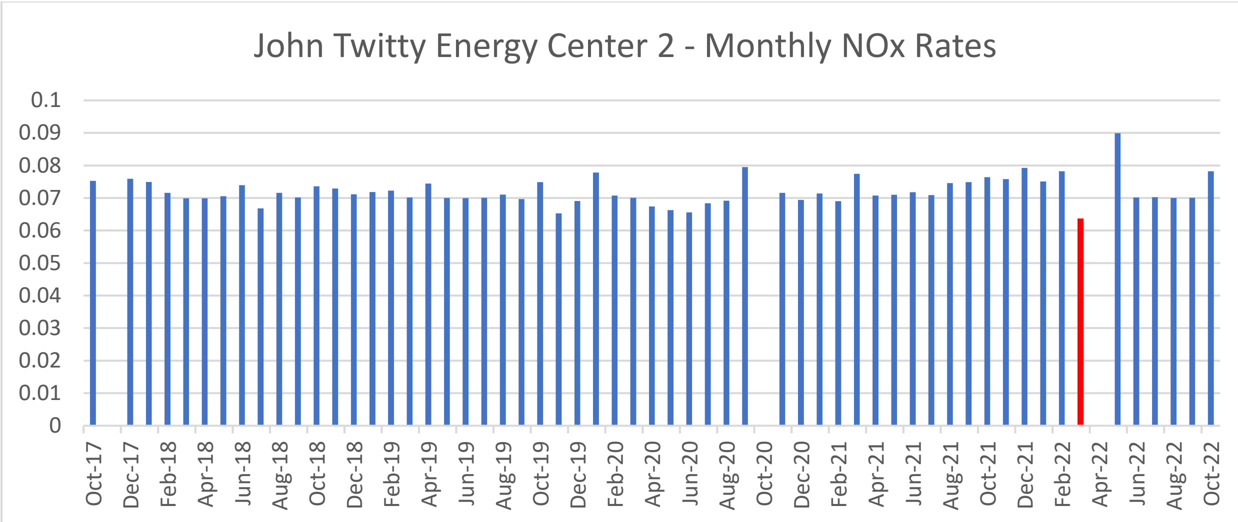


The chart above confirms that John Twitty Energy Center Unit 1 has consistently achieved levels below 0.08 lb/MMBtu on several months of recent operation, with a low of .0693 lb/MMBtu, shown in red. The chart below shows that John Twitty Energy Center Unit 1 has achieved less than 0.08 lb/MMBtu over a range of ozone-season operating capacity factors.

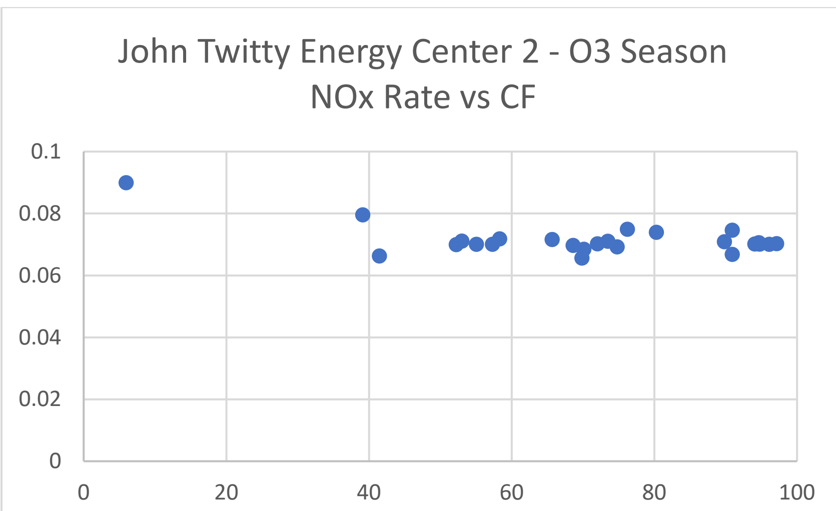


JTEC 2: Unit 2 (300 MW) at the John Twitty Energy Center plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emissions rates at or below 0.07 lb/MMBtu. It is not operating consistent with its lowest demonstrated NOx reduction capacity.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
John Twitty Energy Center	1	194	0.0693	0.2564	
John Twitty Energy Center	2	300	0.0637	0.0899	

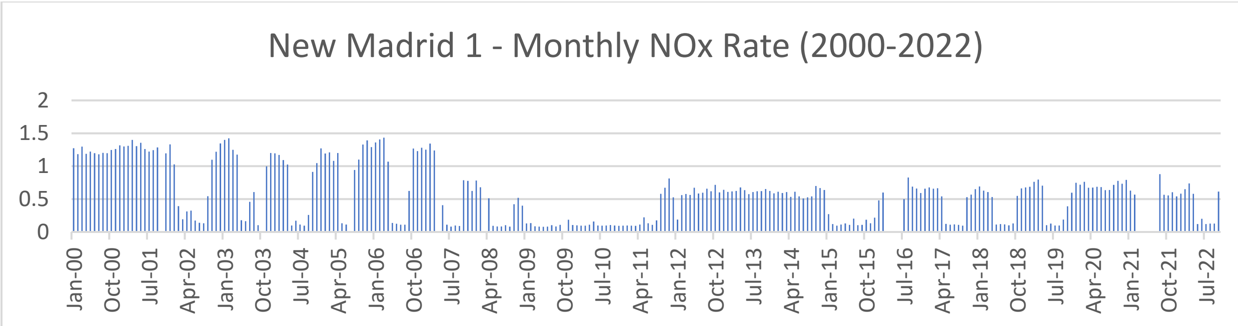


The chart above confirms that John Twitty Energy Center Unit 2 has achieved levels below 0.07 lb/MMBtu on several months of recent operation, with a low of .0637 lb/MMBtu, shown in red. The chart below shows that John Twitty Energy Center Unit 2 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

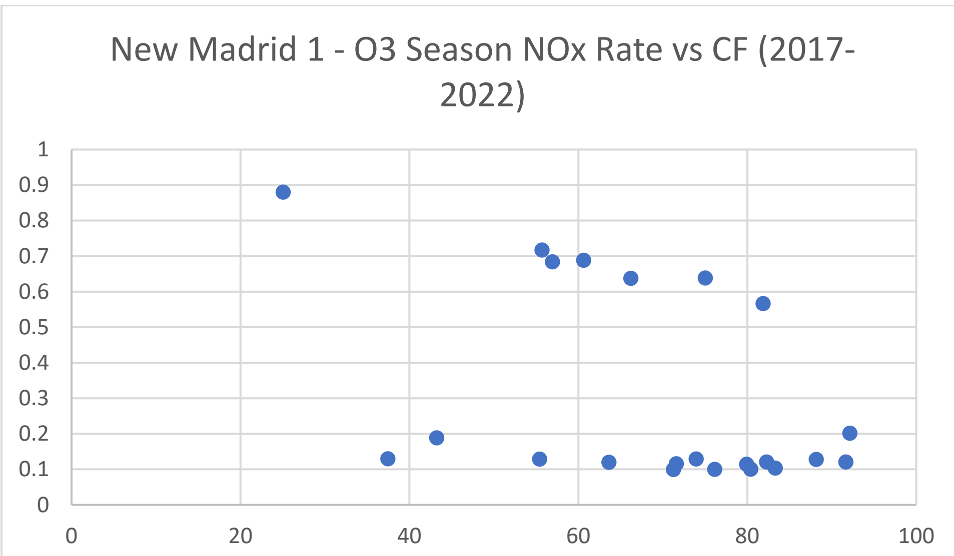


New Madrid 1: Unit 1 (600 MW) at the New Madrid plant was analyzed. This unit has SCR installed. Its NOx emissions rates are wildly variable. The unit can reliably achieve NOx emission rates below 0.10 lb/MMBtu. It is clearly not operating its SCR according to the SCR's NOx reduction capacity. During some ozone seasons, it is emitting at 0.87 lb/MMBtu, over 800% of its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below demonstrate.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
New Madrid	1	600	0.0991	0.08	0.8797	0.8797
New Madrid	2	600	0.1007	0.0764	1.0742	0.6420

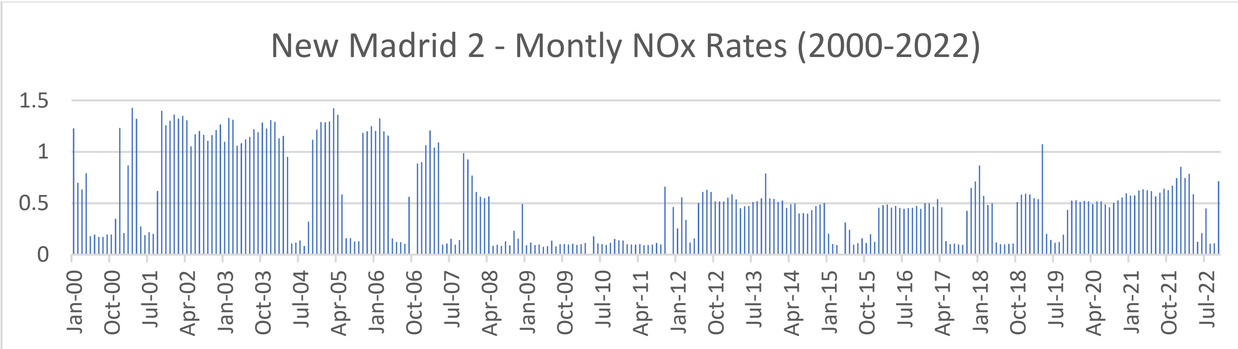


The chart above confirms that New Madrid 1 has reliably achieved levels below 0.10 lb/MMBtu, with a low of .0991 lb/MMBtu. The chart below shows that New Madrid Unit 1 has achieved levels less than approximately 0.10 lb/MMBtu over a range of ozone-season operating capacity factors.

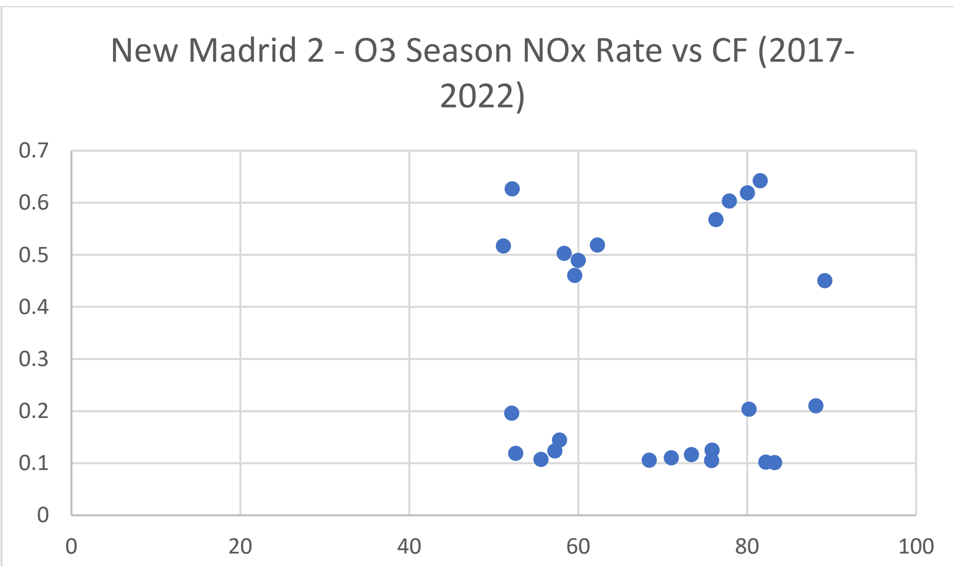


New Madrid 2: Unit 2 (600 MW) at the New Madrid plant was analyzed. Its NOx emissions rates are wildly variable. The unit can reliably achieve NOx emission rates below approximately 0.10 lb/MMBtu. It is clearly not operating its SCR according to the SCR's NOx reduction capacity. During some ozone seasons, it is emitting at 0.64 lb/MMBtu, over 600% of its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below demonstrate.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
New Madrid	1	600	0.0991	0.08	0.8797	0.8797
New Madrid	2	600	0.1007	0.0764	1.0742	0.6420

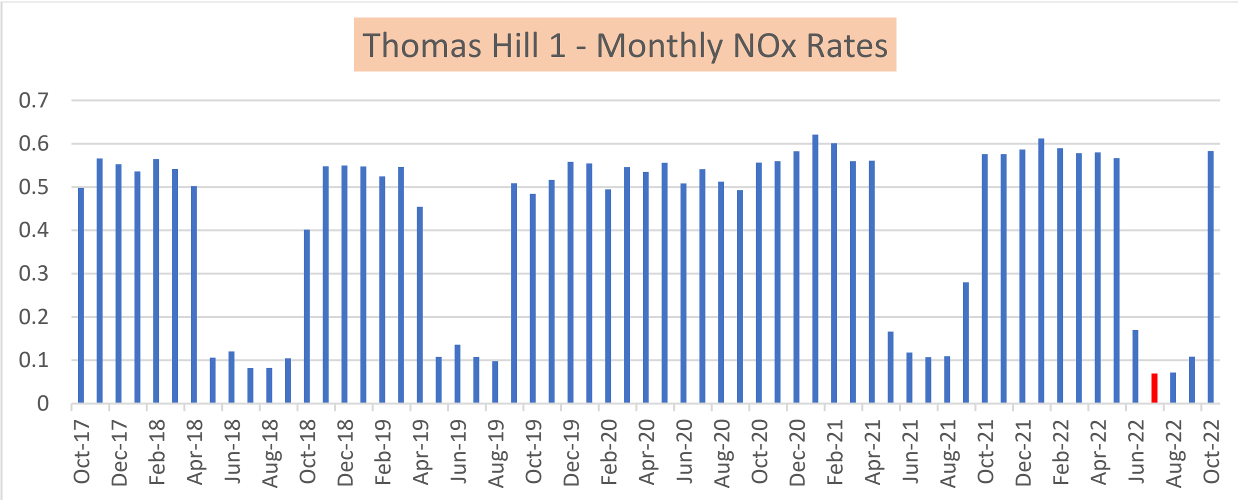


The chart above confirms that New Madrid 2 has reliably achieved levels of approximately 0.10 lb/MMBtu, with a low of .1007 lb/MMBtu. The chart below shows that New Madrid Unit 2 has achieved levels of approximately 0.10 lb/MMBtu over a range of ozone-season operating capacity factors.

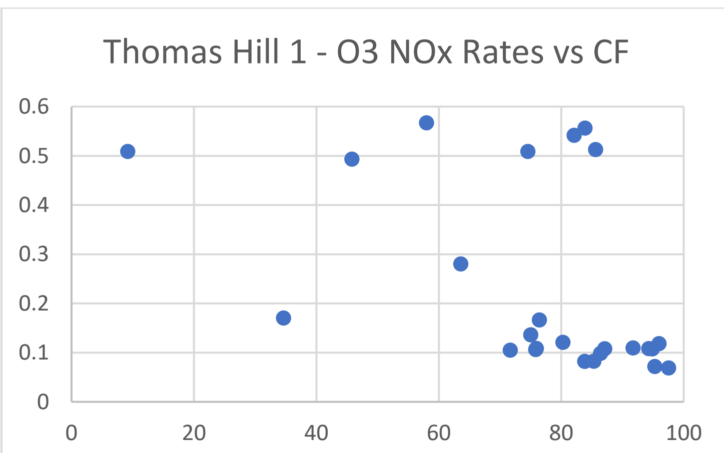


TH 1: Unit 1 (180 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

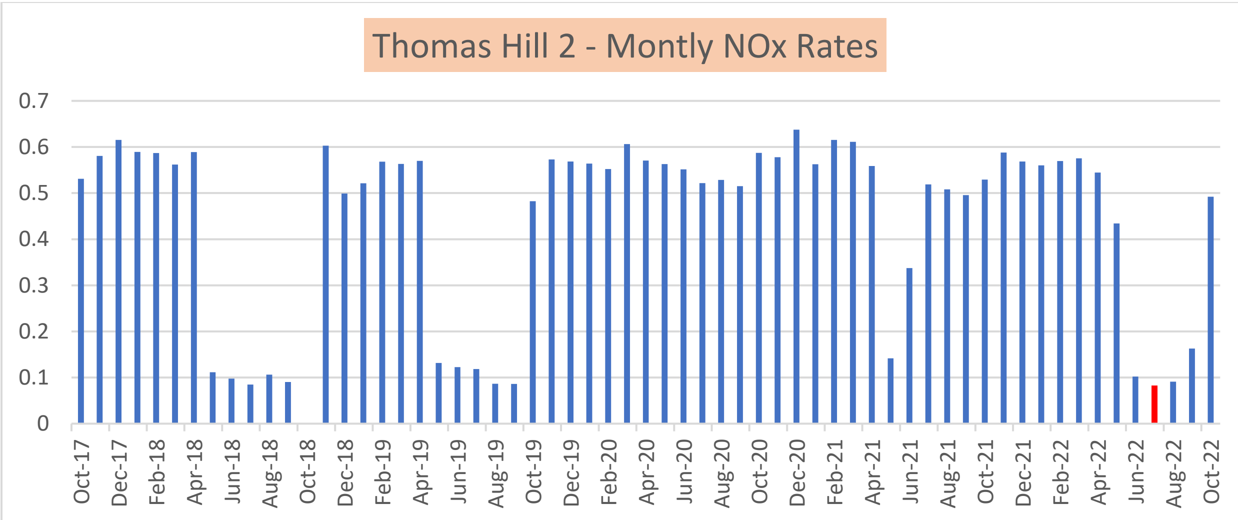


The chart above confirms that Thomas Hill 1 has reliably achieved levels below 0.10 lb/MMBtu, with a low of .0686 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 1 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

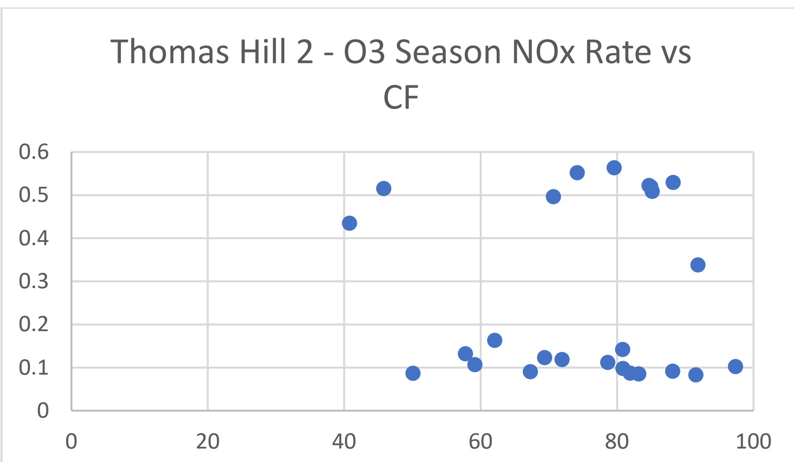


TH 2: Unit 2 (285 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

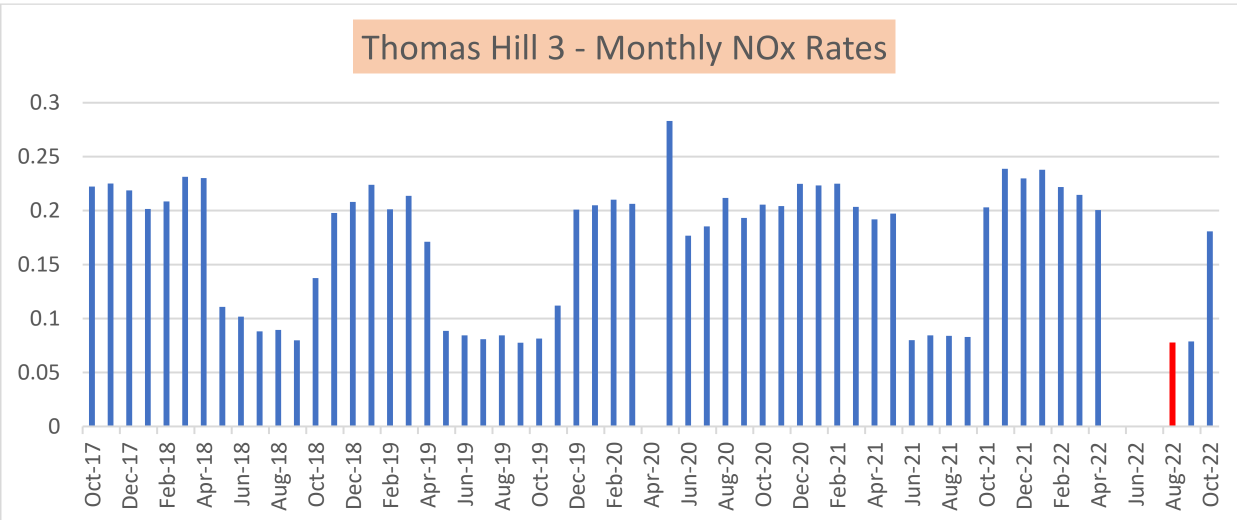


The chart above confirms that Thomas Hill 2 has achieved levels below 0.10 lb/MMBtu, with a low of .0825 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 2 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

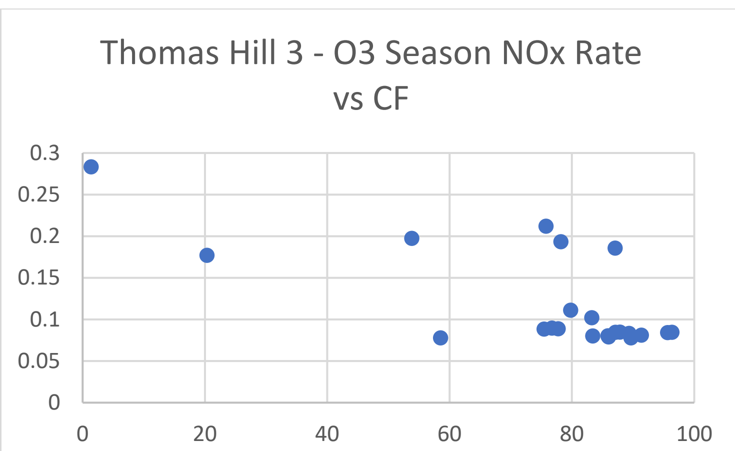


TH 3: Unit 3 (670 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

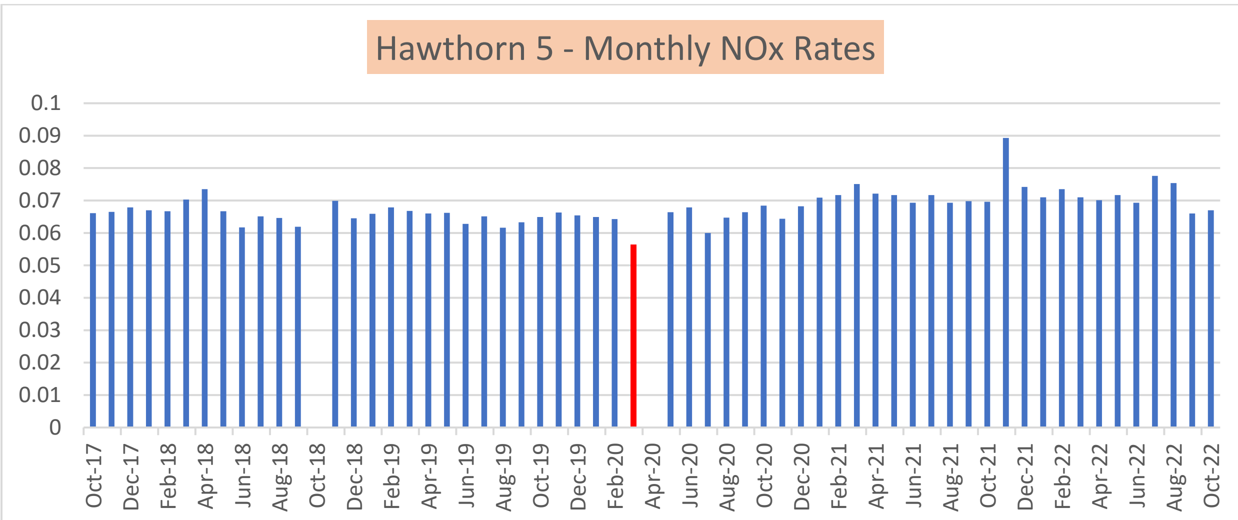


The chart above confirms that Thomas Hill 3 has achieved levels below 0.10 lb/MMBtu, with a low of .0775 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 3 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

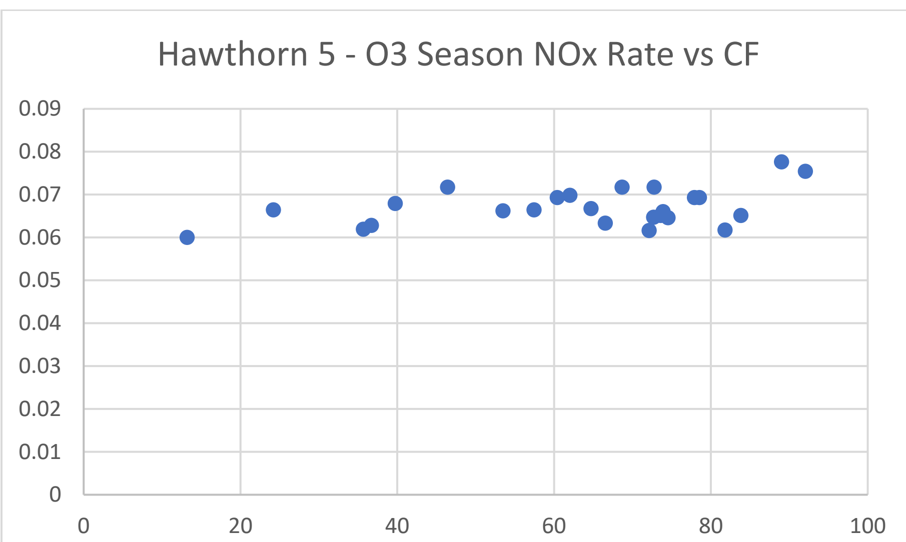


Hawthorn 5: Unit 5 (594 MW) at the Hawthorn plant was analyzed. It has SCR installed. The unit can reliably achieve NOx emissions rates of below 0.07 lb/MMBtu. It is not operating its SCR consistent with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Hawthorn	5	594	0.0563	0.0893	0.0776



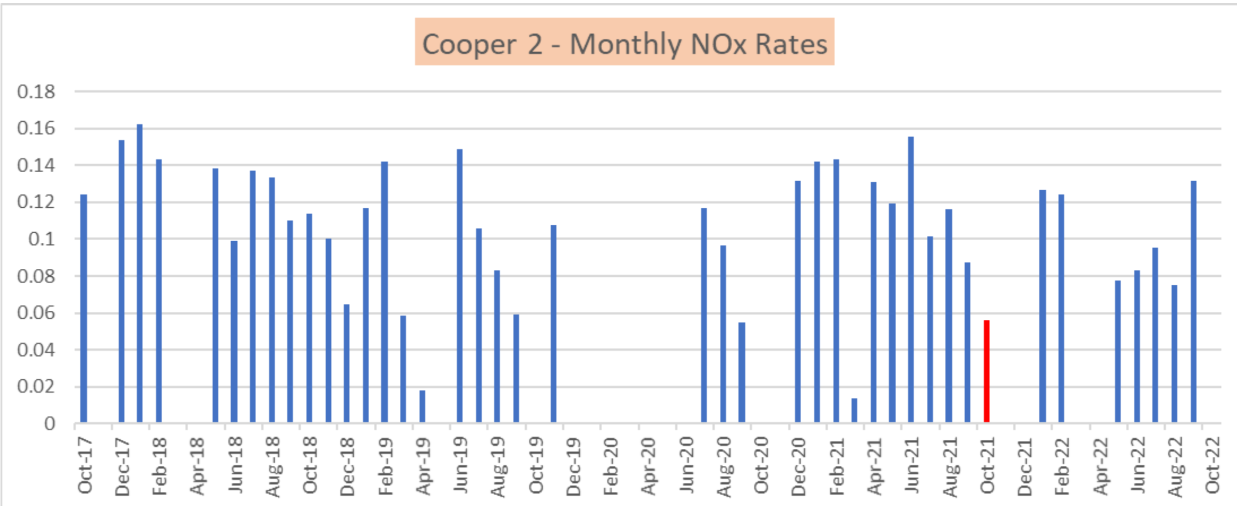
The chart above confirms that Hawthorn Unit 5 has achieved levels below 0.07 lb/MMBtu on many months of recent operation, with a low of 0.0563 lb/MMBtu, shown in red. The chart below shows that Hawthorn Unit 5 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.



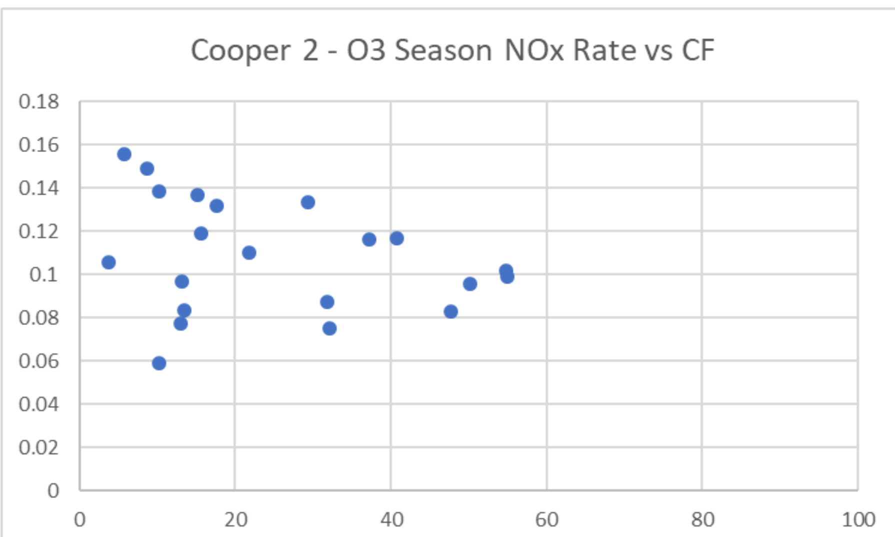
Kentucky

Cooper 2: Unit 2 (230 MW) at the Cooper plant was analyzed. It has SCR installed. It can achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emissions rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently according to the SCR's lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Cooper	2	230	0.0563	0.1625	0.1554

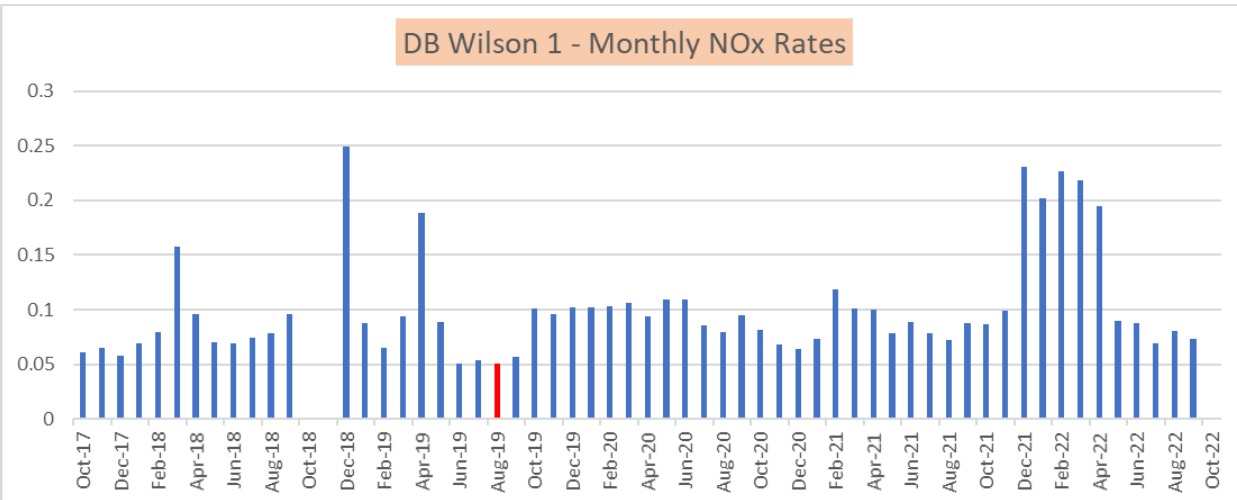


The chart above confirms that Cooper Unit 2 has achieved levels below 0.10 lb/MMBtu on many months of recent operation, with a low of 0.0563 lb/MMBtu, shown in red.

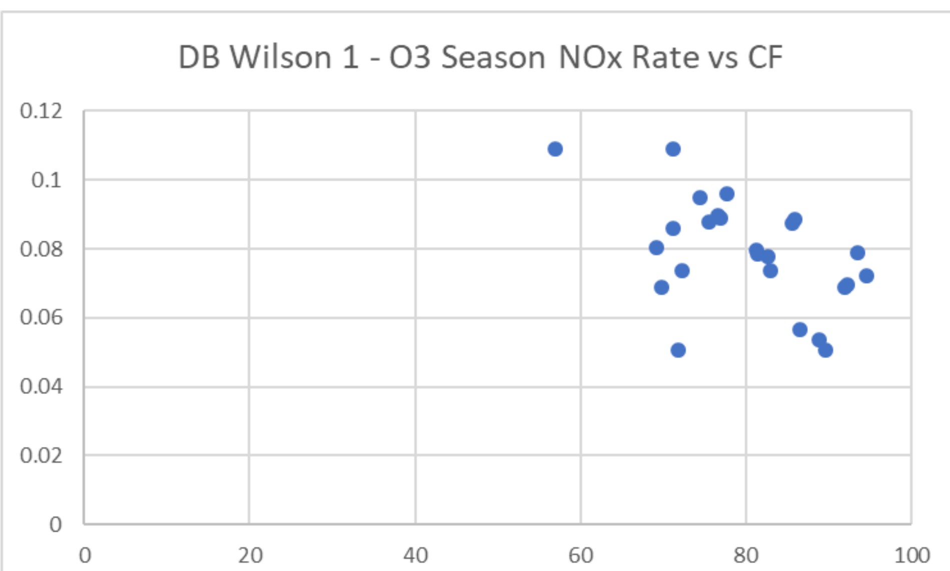


DB Wilson 1: Unit 1 (566 MW) at the DB Wilson plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of below 0.07 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
DB Wilson	1	566	0.0505	0.2491	0.1091

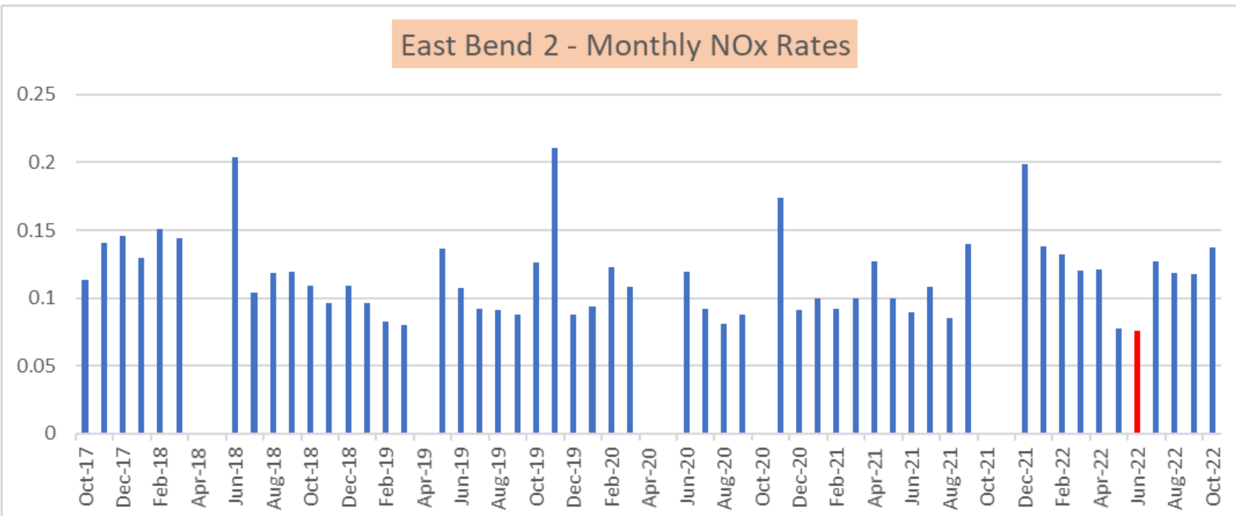


The chart above confirms that DB Wilson Unit 1 can reliably achieve levels below 0.07 lb/MMBtu on several months of operation, with a low of 0.0505 lb/MMBtu, shown in red. The chart below shows that DB Wilson Unit 1 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

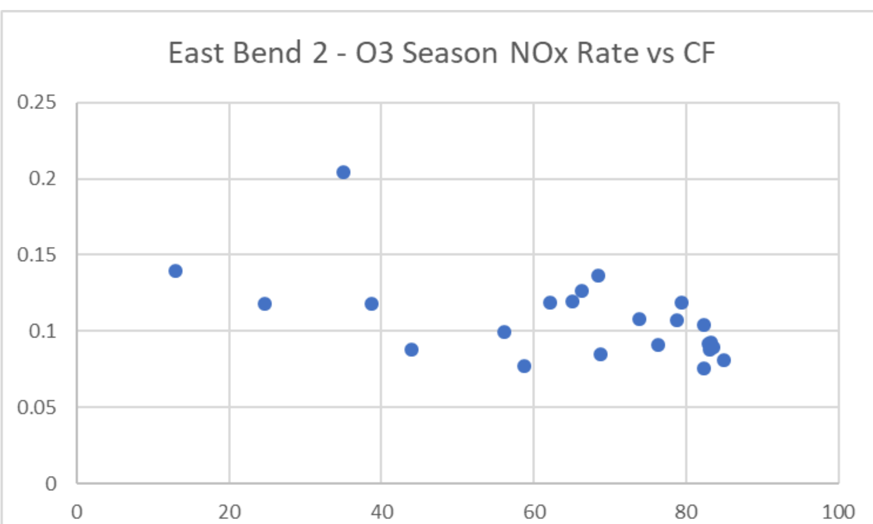


East Bend 2: Unit 2 (669 MW) at the East Bend plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
East Bend	2	669	0.0758	0.2110	0.2041

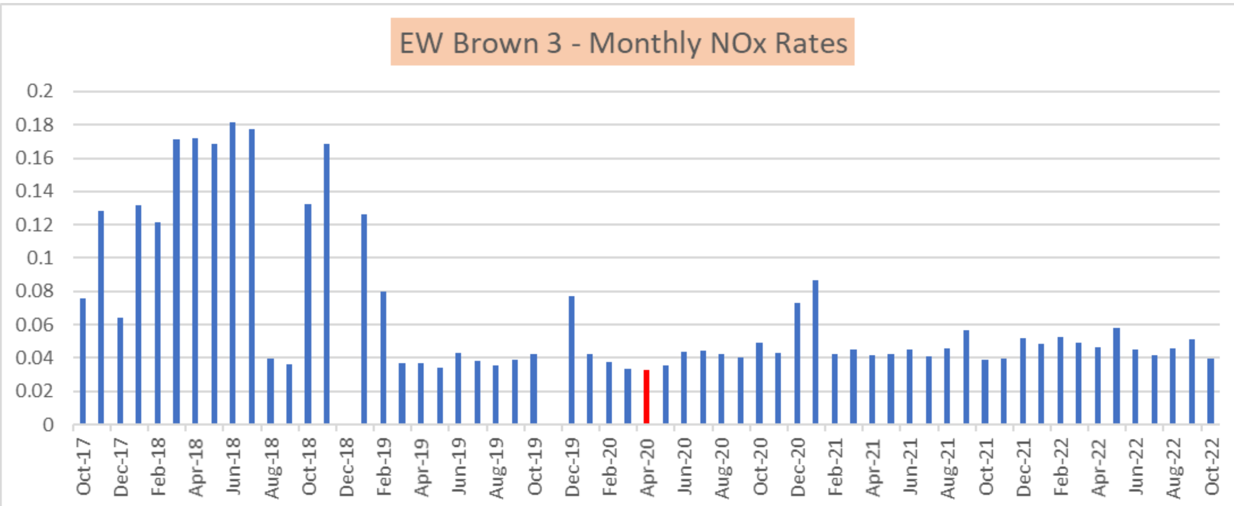


The chart above confirms that East Bend Unit 2 has regularly achieved levels of below 0.10 lb/MMBtu, with a low of 0.0758 lb/MMBtu, shown in red. The chart below shows that East Bend 2 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

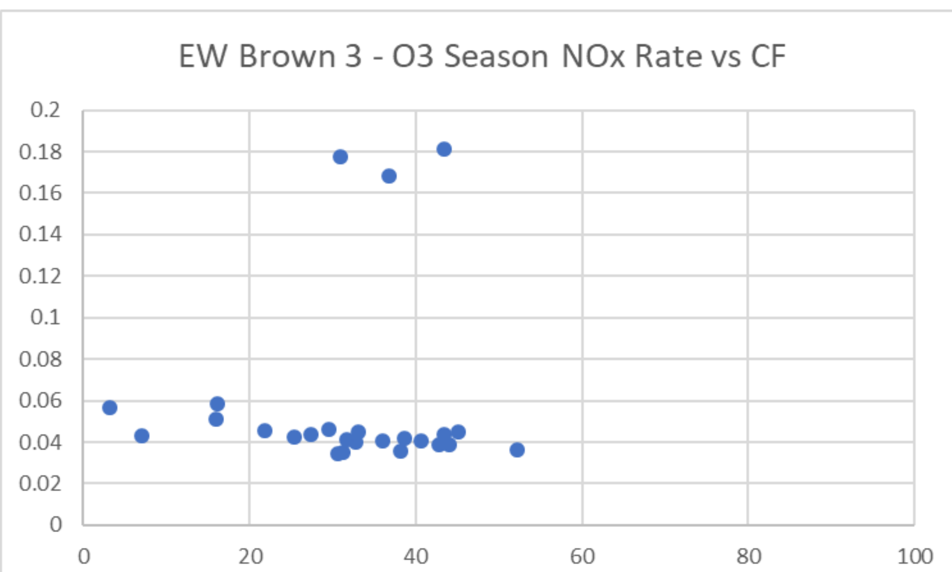


EW Brown 3: Unit 3 (464 MW) at the EW Brown plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of approximately 0.04 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
EW Brown	3	464	0.0326	0.1813	0.1813

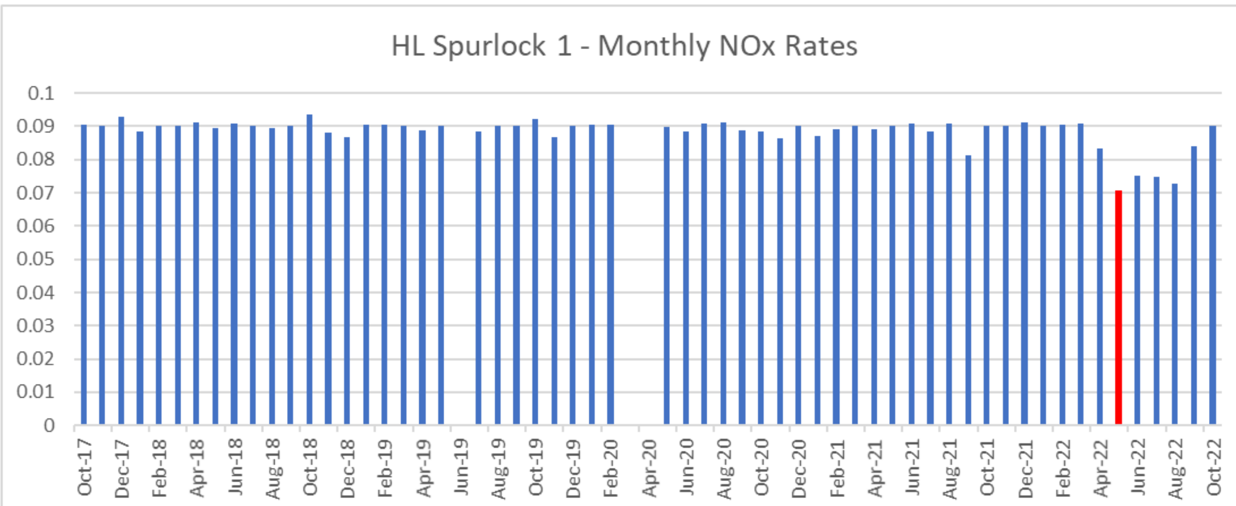


The chart above confirms that EW Brown Unit 3 has regularly achieved levels of approximately 0.04 lb/MMBtu, with a low of 0.0326 lb/MMBtu, shown in red. The chart below shows that EW Brown Unit 3 has achieved less than 0.04 lb/MMBtu over a wide range of ozone-season operating capacity factors.

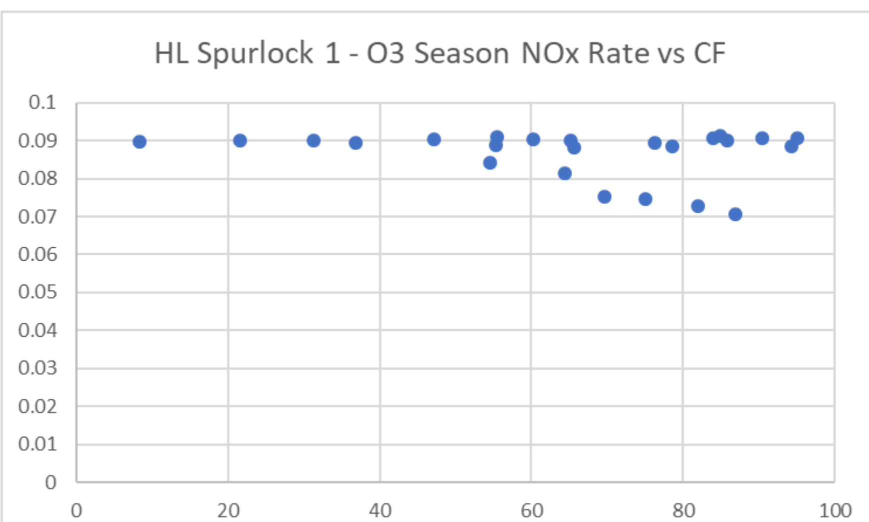


HL Spurlock 1: Unit 1 (385 MW) at the HL Spurlock plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.09 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
HL Spurlock	1	358	0.0707	0.0936	0.0912
HL Spurlock	2	592	0.0604	0.1290	0.0921

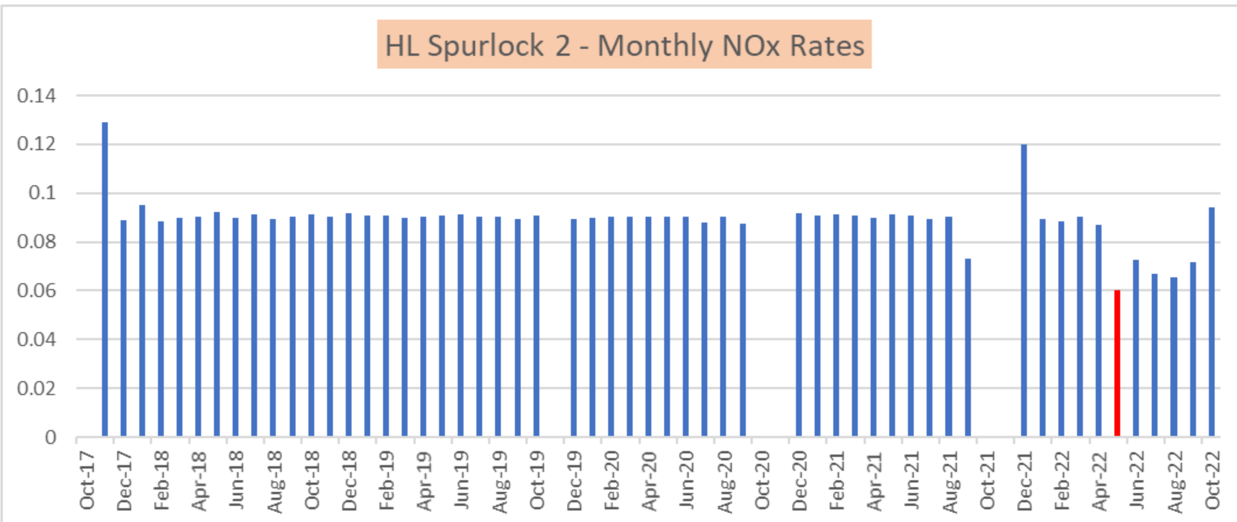


The chart above confirms that Spurlock Unit 1 reliably achieves NOx emissions of below 0.09 lb/MMBtu, and has maintained NOx emissions of below 0.08 lb/MMBtu during the 2022 ozone season, with a low of 0.0707 lb/MMBtu, shown in red. The chart below shows that Spurlock 1 has achieved less than 0.09 lb/MMBtu and below over a wide range of ozone-season operating capacity factors.

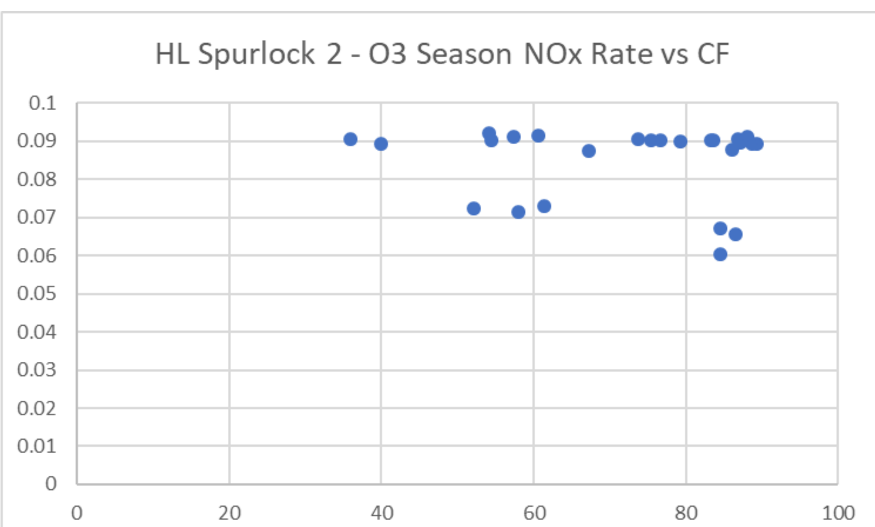


HL Spurlock 2: Unit 2 (592 MW) at the Spurlock 2 plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.09 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
HL Spurlock	1	358	0.0707	0.0936	0.0912
HL Spurlock	2	592	0.0604	0.1290	0.0921

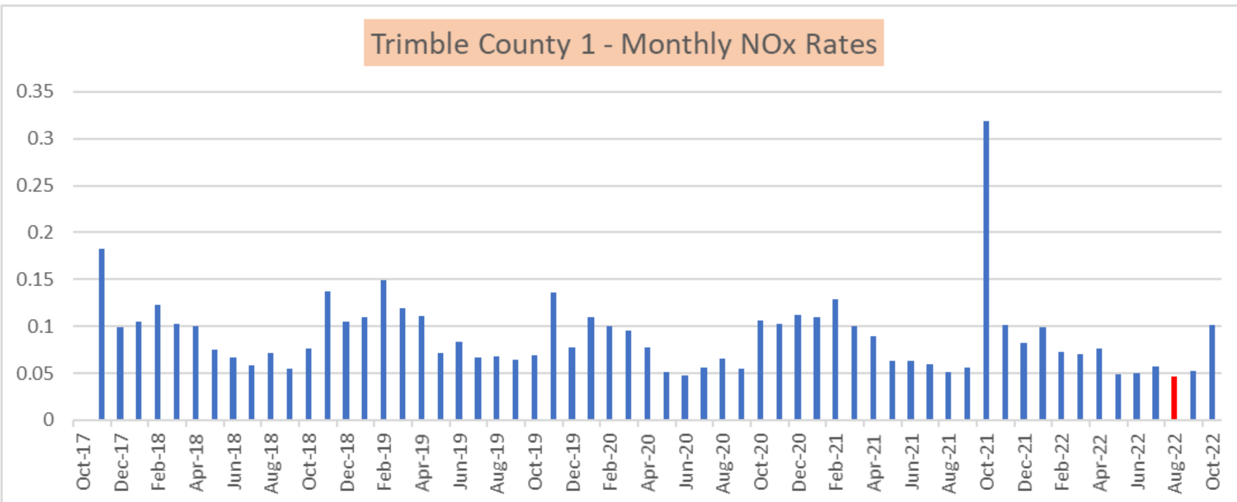


The chart above confirms that Spurlock Unit 2 reliably achieves NOx emissions of below 0.09 lb/MMBtu, and has maintained NOx emissions of below 0.08 lb/MMBtu during the 2022 ozone season, with a low of 0.0604 lb/MMBtu, shown in red. The chart below shows that Spurlock 2 has achieved less than 0.09 lb/MMBtu and below over a range of ozone-season operating capacity factors.

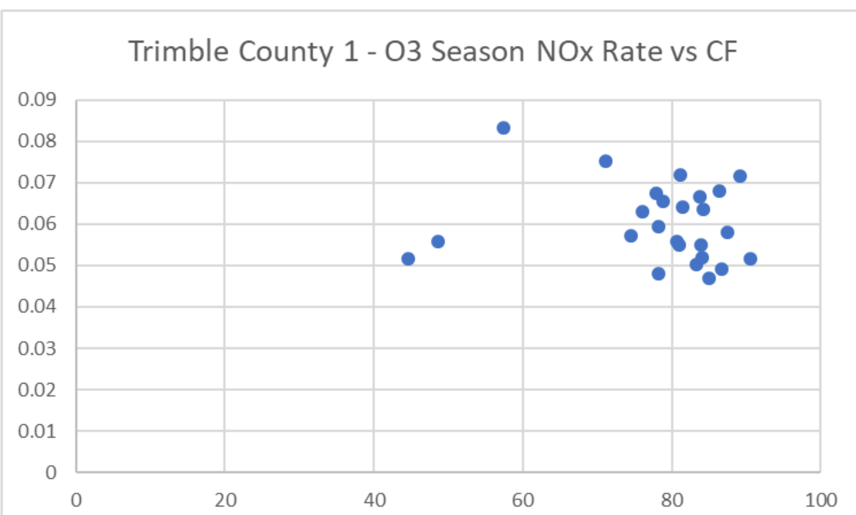


TC 1: Unit 1 (566 MW) at the Trimble County plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.07 lb/MMBtu and below, regularly achieving approximately 0.05 lb/MMBtu during ozone seasons 2022, 2021, and 2020. It is clearly not operating its SCR according to the SCR's NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Trimble County	1	566	0.0470	0.3192	0.0832
Trimble County	2	834	0.0257	0.3788	0.0757

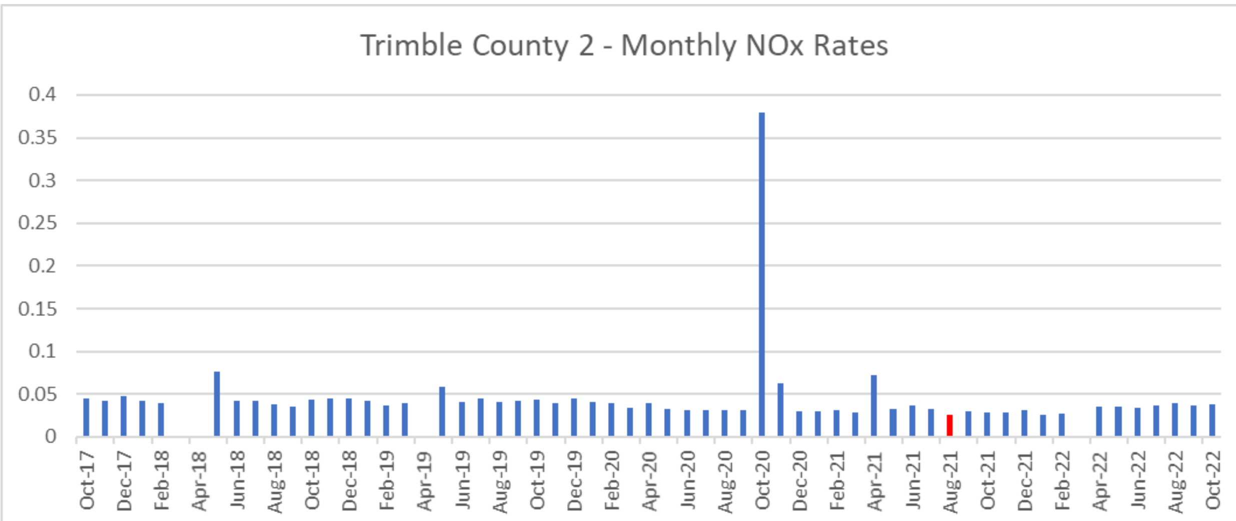


The chart above confirms that Trimble County 1 has achieved levels below 0.05 lb/MMBtu, with a low of .0470 lb/MMBtu, shown in red. The chart below shows that Trimble County 1 has achieved less than 0.05 lb/MMBtu over a range of ozone-season operating capacity factors.

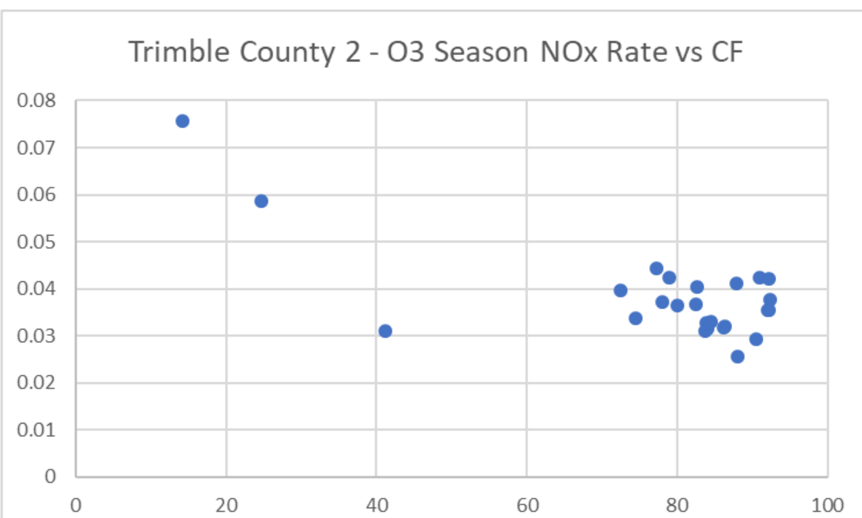


TC 2: Unit 2 (834 MW) at the Trimble County plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Trimble County	1	566	0.0470	0.3192	0.0832
Trimble County	2	834	0.0257	0.3788	0.0757

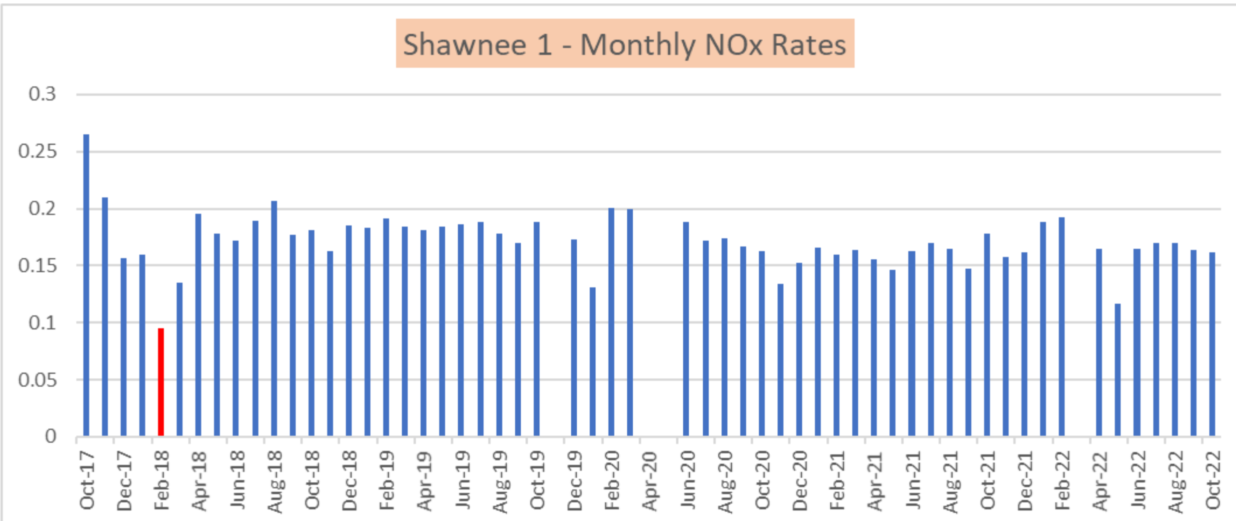


The chart above confirms that Trimble County 2 has often achieved levels well below 0.05 lb/MMBtu, with a low of .0257 lb/MMBtu, shown in red. The chart below shows that Trimble County 2 has achieved less than 0.05 lb/MMBtu over a range of ozone-season operating capacity factors.

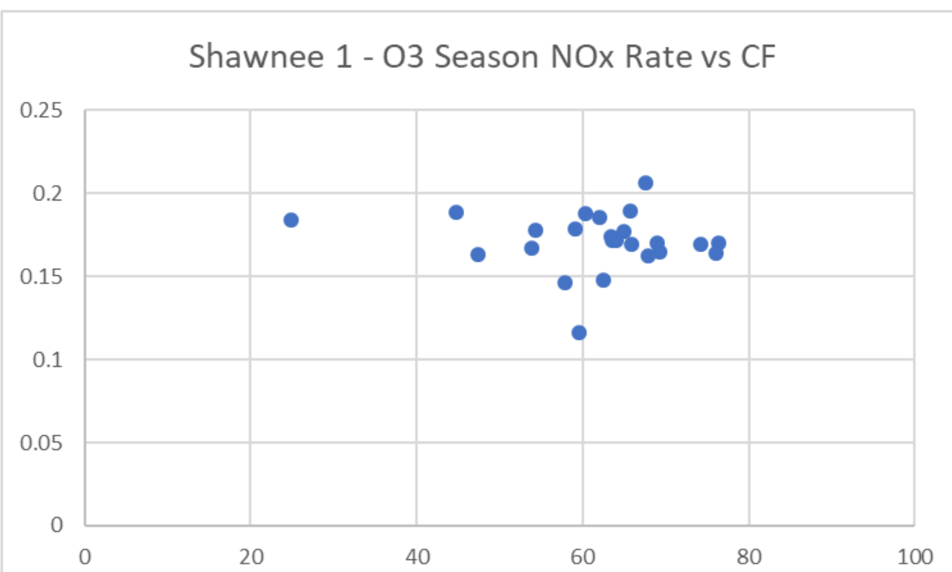


Shawnee 1: Unit 1 (175 MW) at the Shawnee plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Shawnee	1	175	0.0954	N/A	0.2655	0.2063
Shawnee	4	175	0.1045	0.1045	0.2517	0.2057

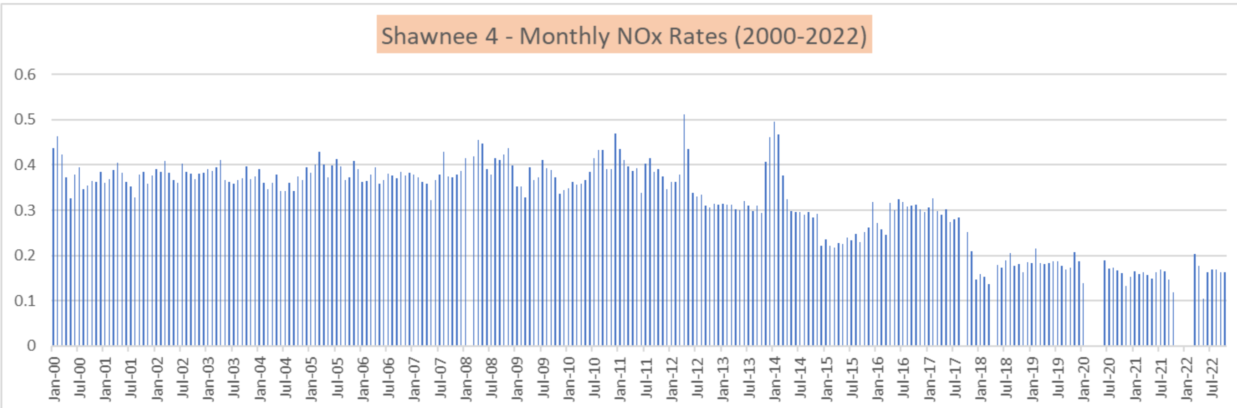


The chart above confirms that Shawnee 1 has consistently exceeded 0.15 lb/MMBtu, and on occasion has been shown to reduce NOx emissions rates to below 0.10 lb/MMBtu, with a low of .0954 lb/MMBtu, shown in red. The chart below shows that Shawnee 1's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

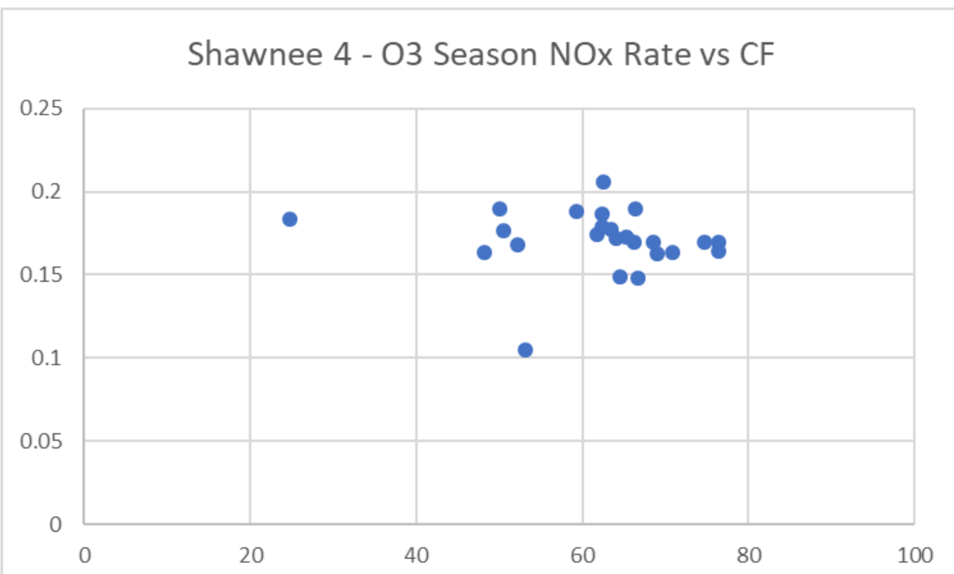


Shawnee 4: Unit 4 (175 MW) at the Shawnee plant. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Shawnee	1	175	0.0954	N/A	0.2655	0.2063
Shawnee	4	175	0.1045	0.1045	0.2517	0.2057

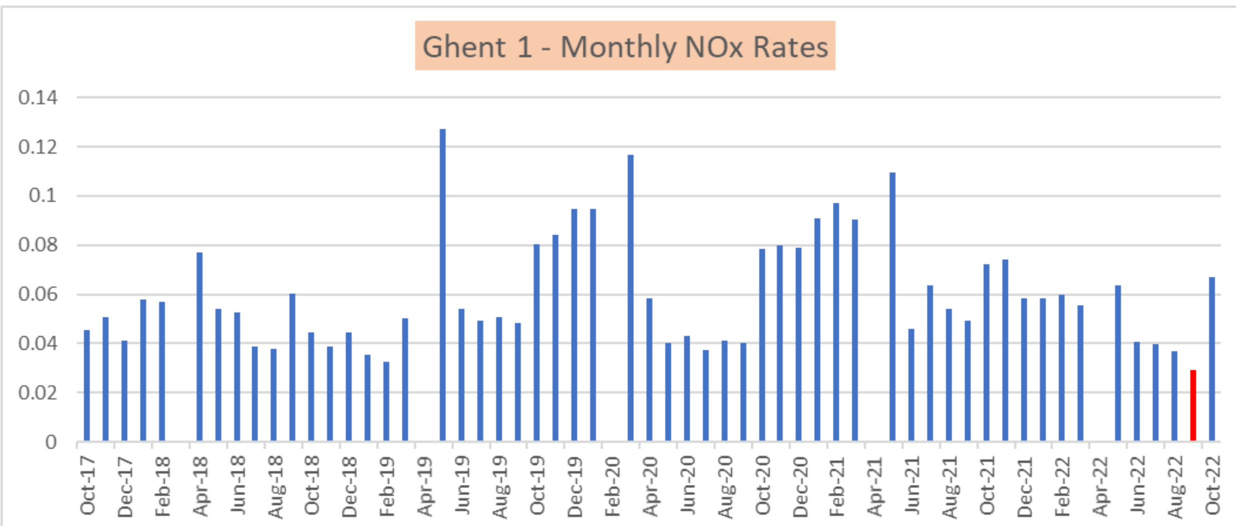


The chart above confirms that Shawnee 4 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .1045 lb/MMBtu, shown in red. The chart below shows that Shawnee 4's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

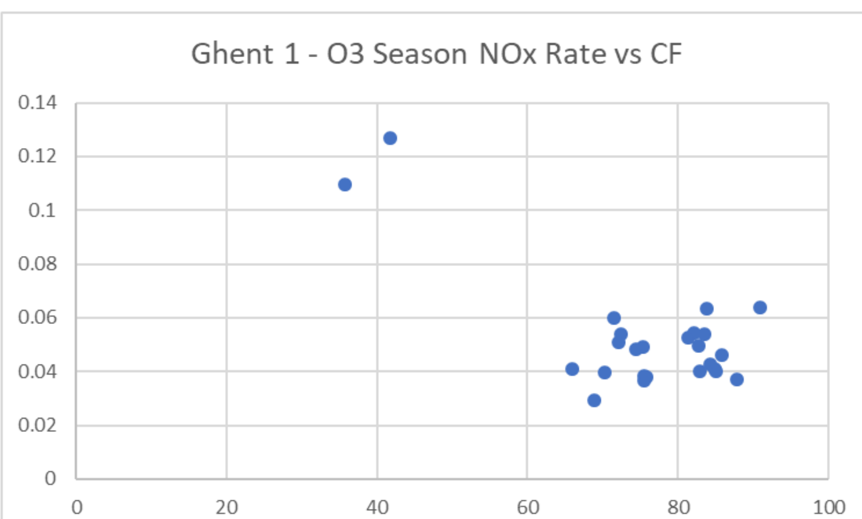


Ghent 1: Unit 1 (557 MW) at the Ghent plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of below 0.04 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capabilities, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

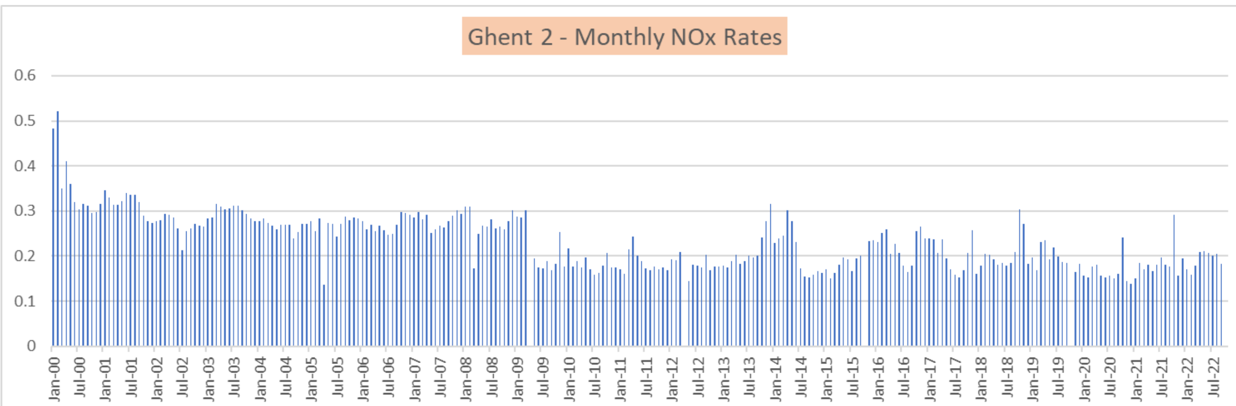


The chart above confirms that Ghent 1 has achieved levels below 0.04 lb/MMBtu, with a low of .0292 lb/MMBtu, shown in red. The chart below shows that Ghent 1 has achieved less than 0.04 lb/MMBtu over a range of ozone-season operating capacity factors.

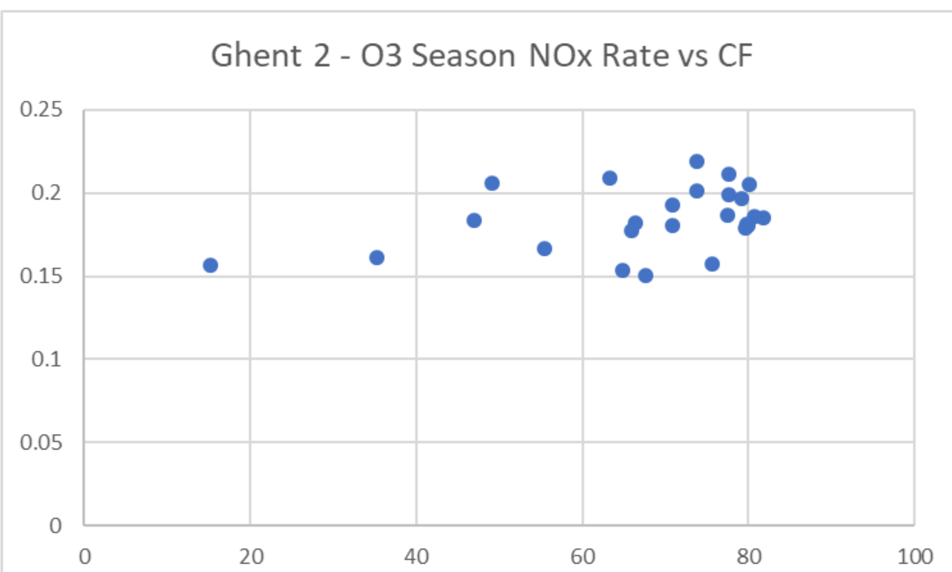


Ghent 2: Unit 2 (556 MW) at the Ghent plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

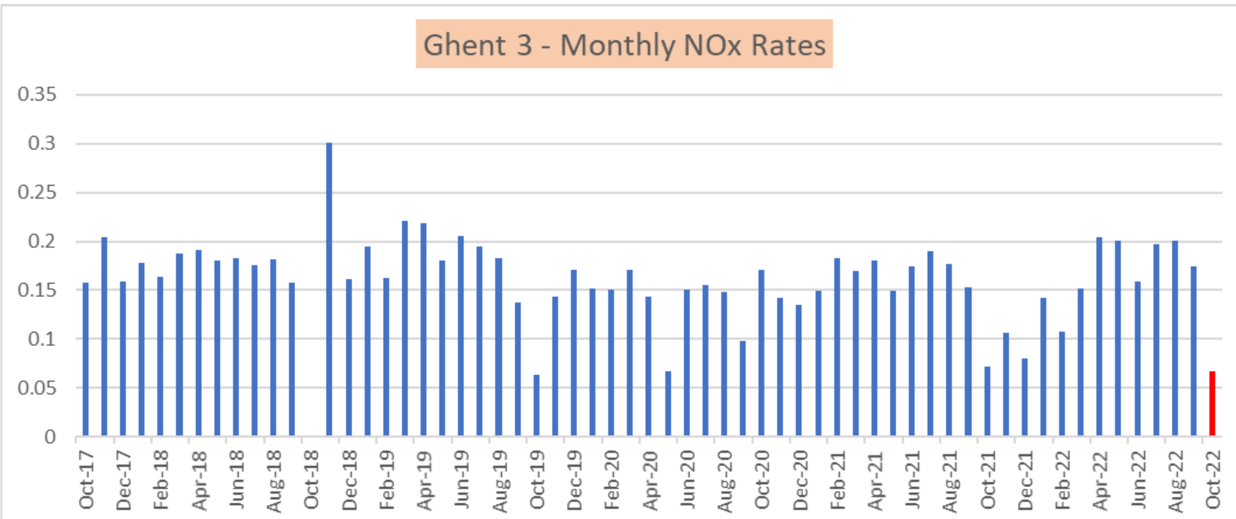


The chart above confirms that Ghent 2 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .1383 lb/MMBtu, shown in red. The chart below shows that Ghent 2's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

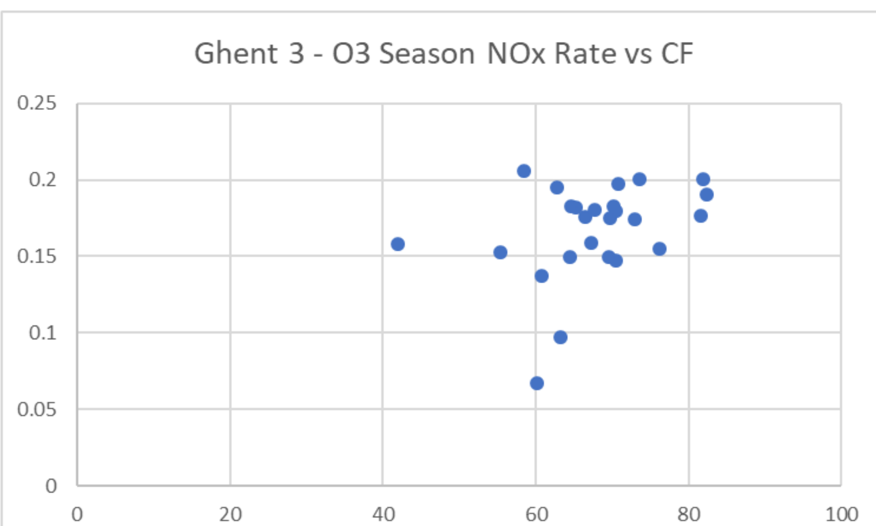


Ghent 3: Unit 3 (557 MW) at the Ghent plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

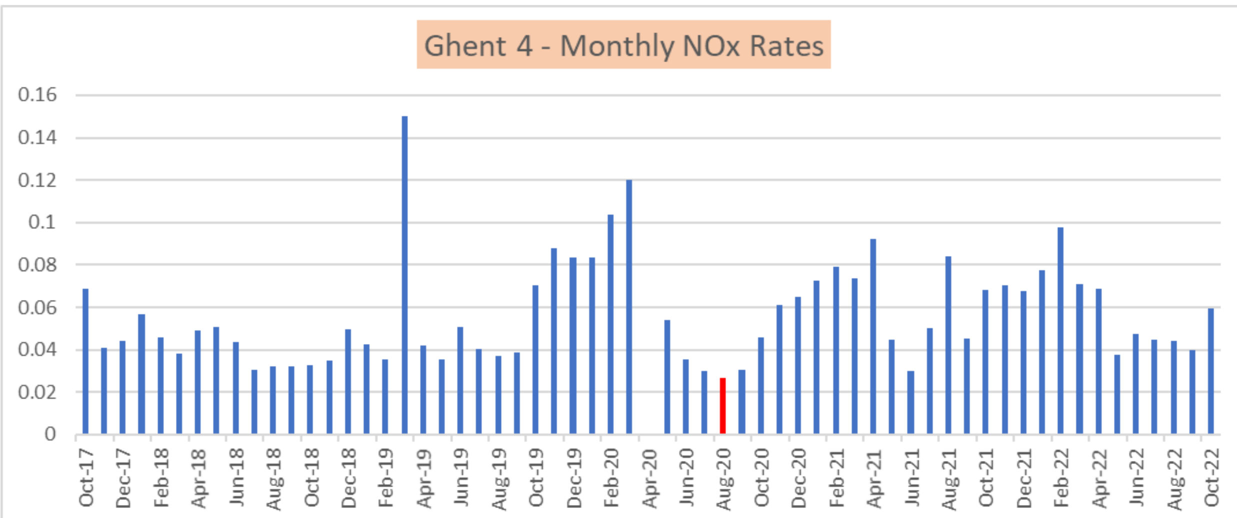


The chart above confirms that Ghent 3 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .0627 lb/MMBtu, shown in red. The chart below shows that Ghent 3's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

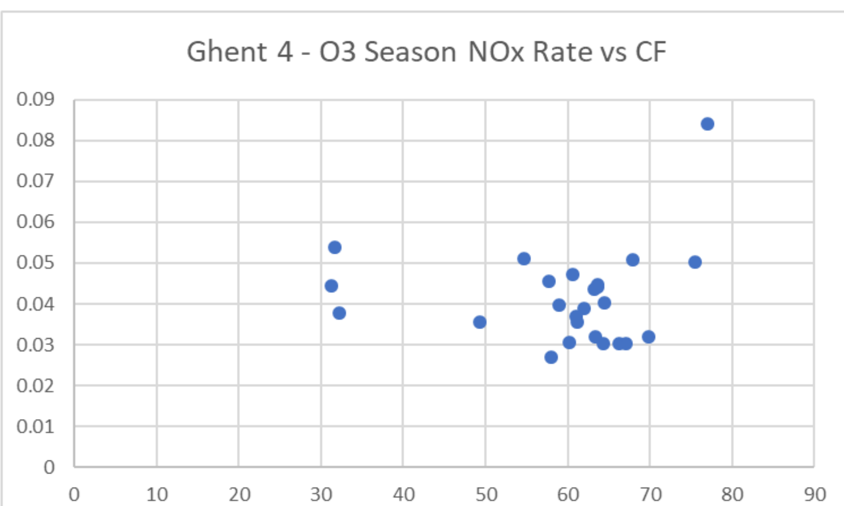


Ghent 4: Unit 3 (556 MW) at the Ghent plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates below 0.04 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842



The chart above confirms that Ghent 4 has often achieved levels below 0.04 lb/MMBtu, with a low of .0268 lb/MMBtu, shown in red. The chart below shows that Ghent 4 has achieved less than 0.04 lb/MMBtu over a wide range of ozone-season operating capacity factors.



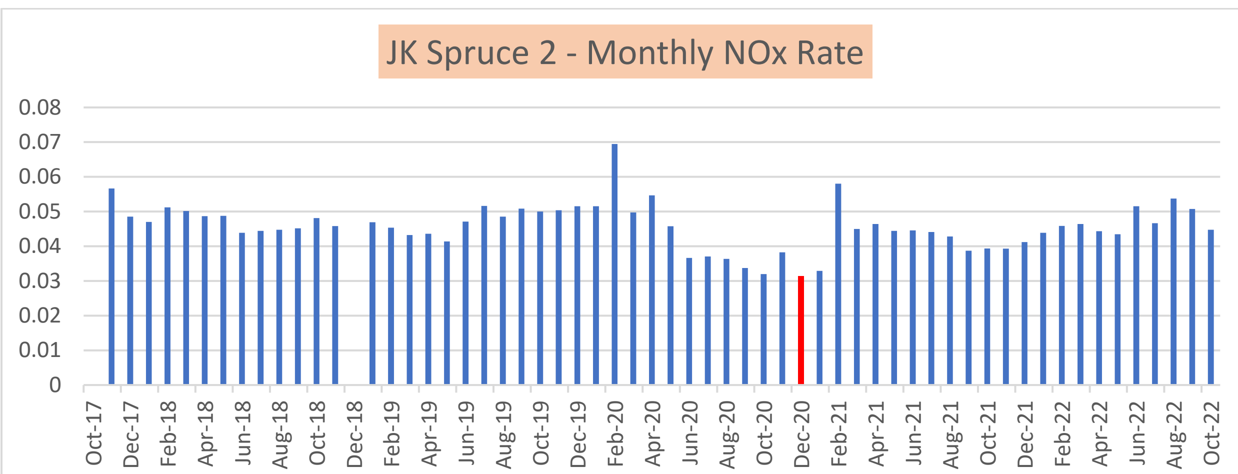
ATTACHMENT 3

NOx Emission Rates at Selected Coal Fired Electricity Generating Units with SCR

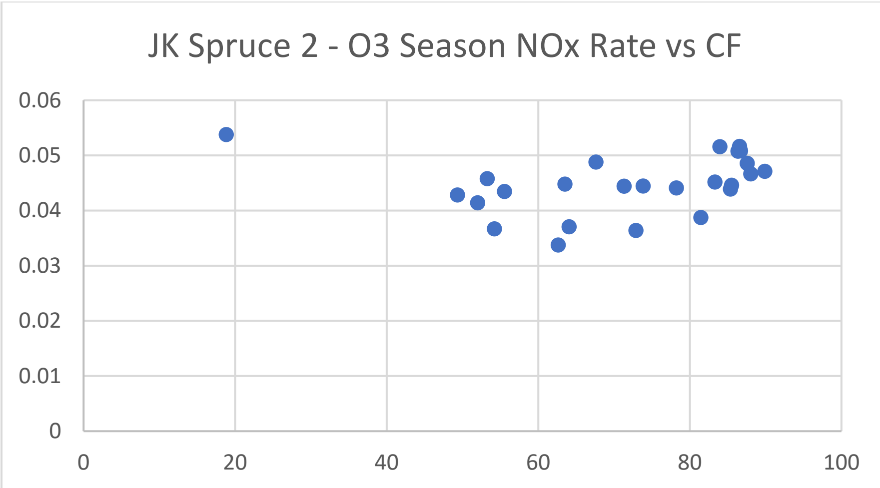
Texas

JK Spruce Unit 2: Unit 2 (878 MW) at the JK Spruce plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates of below 0.04 lb/MMBtu. This unit is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
JK Spruce	2	878	0.0313	0.0695	0.0537

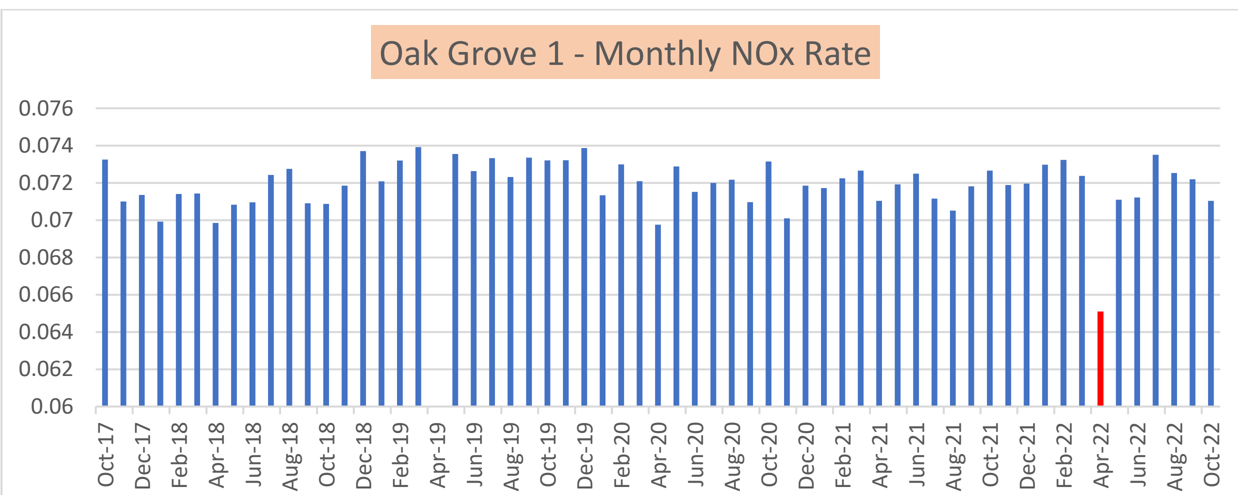


The chart above confirms that JK Spruce Unit 2 has achieved levels below 0.04 lb/MMBtu, with a low of 0.0313 lb/MMBtu, shown in red. The chart below shows that JK Spruce Unit 2 has achieved less than 0.04 lb/MMBtu over a range of ozone-season operating capacity factors.

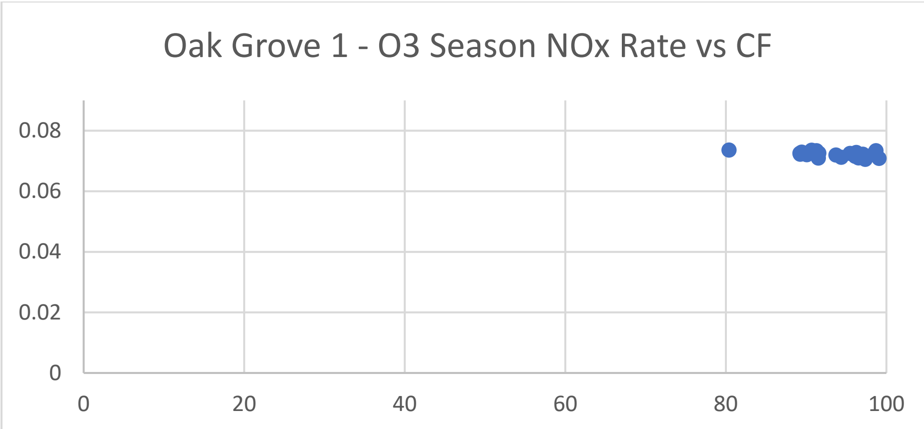


Oak Grove 1: Unit 1 (917 MW) at the Oak Grove plant was analyzed. This unit has SCR installed. It can achieve slightly lower NOx emission rates. It is not operating its SCR consistently according to the SCR's NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Oak Grove	1	917	0.0651	0.0739	0.0736
Oak Grove	2	879	0.0690	0.1117	0.0753

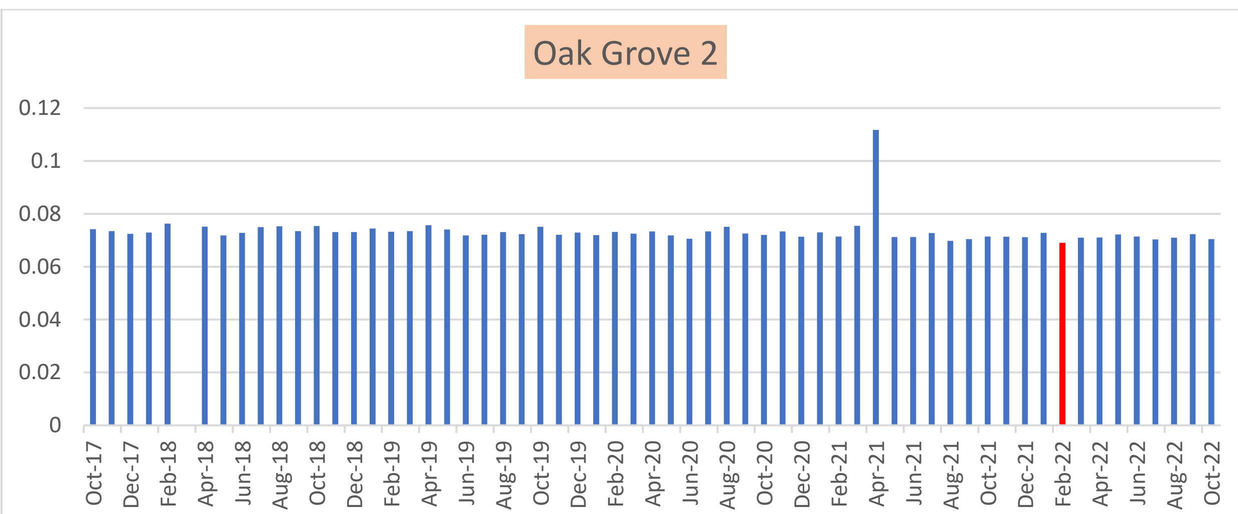


The chart above confirms that Oak Grove Unit 1 has achieved levels below 0.07 lb/MMBtu on several months of recent operation, with a low of 0.0651 lb/MMBtu, shown in red. The chart below shows that Oak Grove Unit 1 has achieved approximately 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

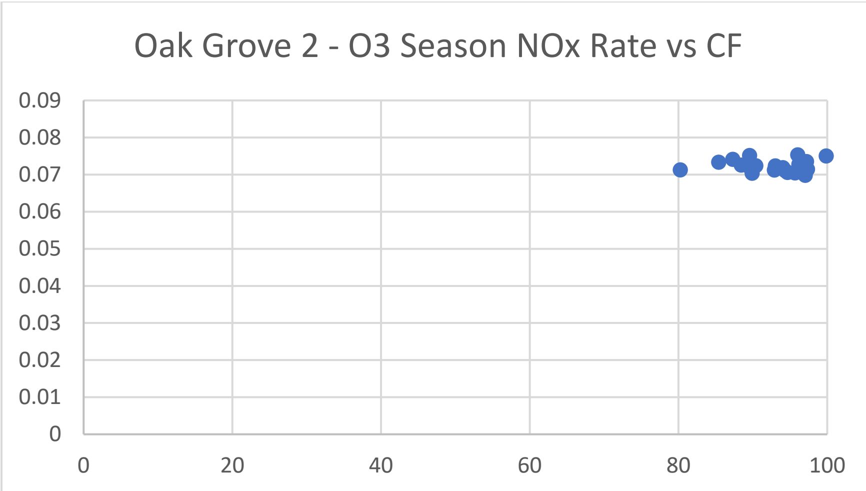


Oak Grove 2: Unit 2 (879 MW) at the Oak Grove plant was analyzed. This unit has SCR installed. It may be able to achieve slightly lower NOx emission rates.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Oak Grove	1	917	0.0651	0.0739	0.0736
Oak Grove	2	879	0.0690	0.1117	0.0753

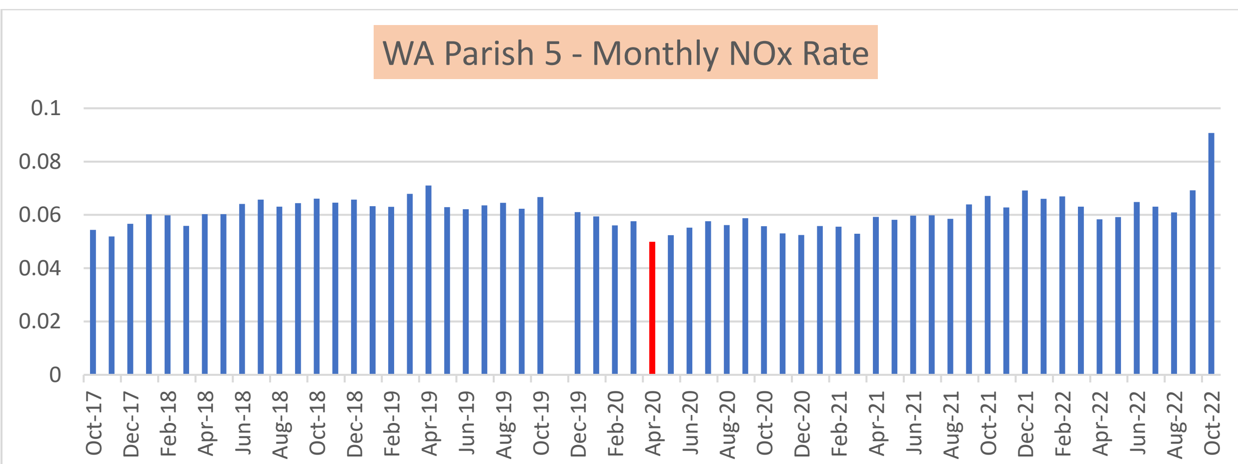


The chart above confirms that Oak Grove Unit 2 regularly achieves NOx emissions rates of approximately 0.07 lb/MMBtu, with a low of 0.0690 lb/MMBtu, shown in red.

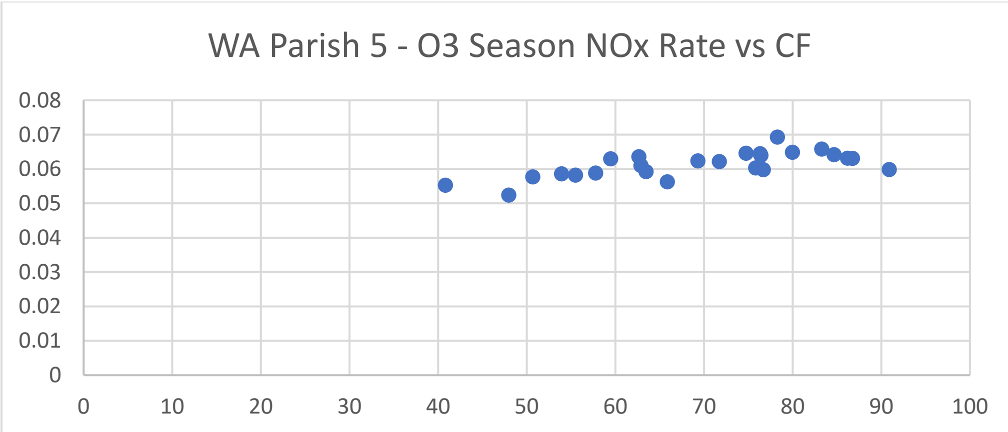


WA Parish Unit 5: Unit 5 (734 MW) at the WA Parish plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.06 lb/MMBtu. It is not operating its SCR consistently in accordance with the lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Parish	5	734	0.0499	0.0908	0.0692

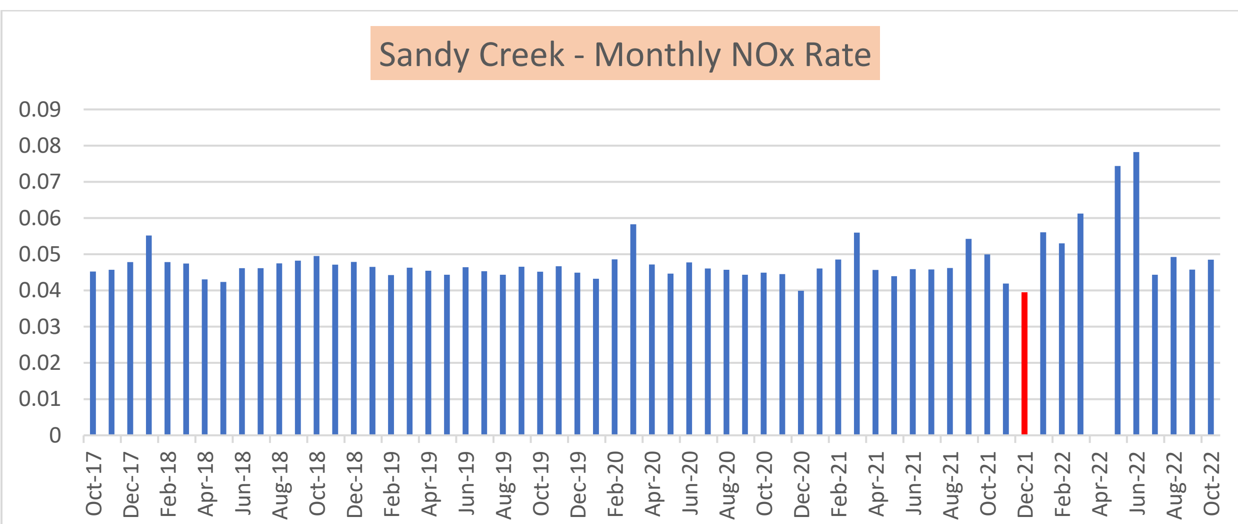


The chart above confirms that WA Parish Unit 5 has achieved levels below 0.06 lb/MMBtu on many months of recent operation, with a low of 0.0499 lb/MMBtu, shown in red. The chart below shows that WA Parish Unit 5 has achieved less than 0.06 lb/MMBtu over a wide range of ozone-season operating capacity factors.

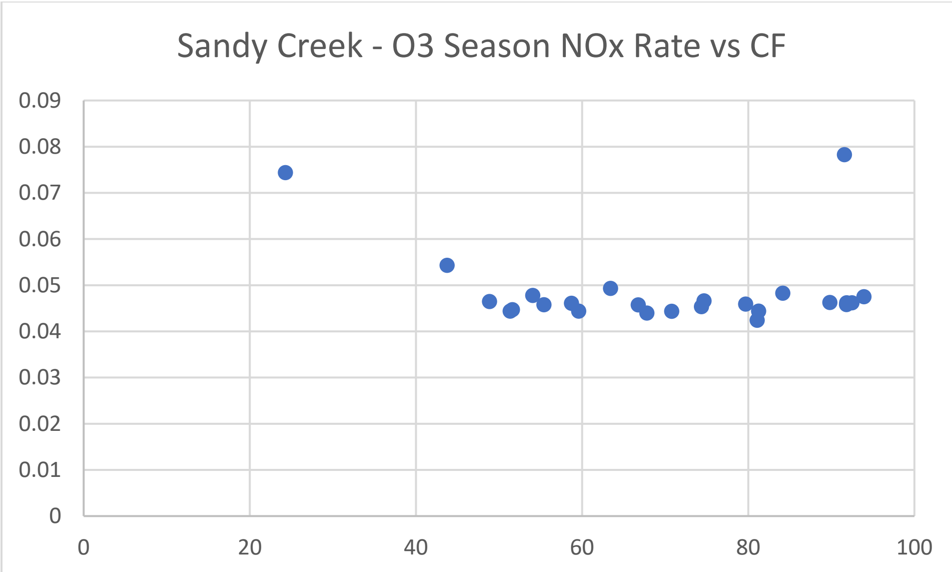


Sandy Creek Unit 1: Sandy Creek Unit 1 (1008 MW) was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Sandy Creek	1	1008	0.0395	0.0782	0.0782



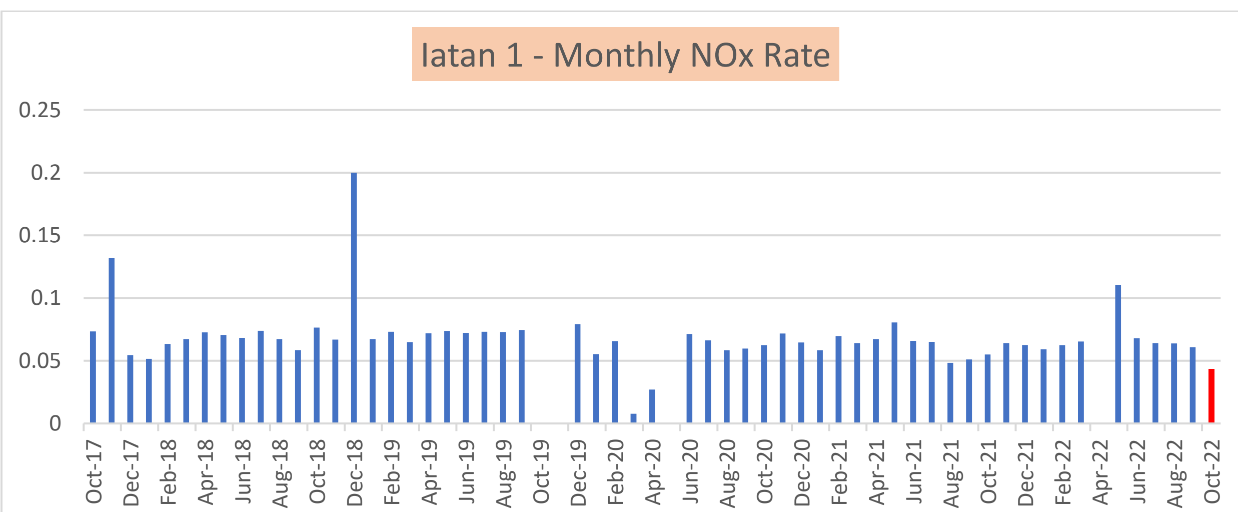
The chart above confirms that Sandy Creek 1 has achieved levels well below 0.05 lb/MMBtu on many months of recent operation, with a low of 0.0395 lb/MMBtu, shown in red. The chart below shows that Sandy Creek 1 has achieved less than 0.05 lb/MMBtu over a wide range of ozone-season operating capacity factors.



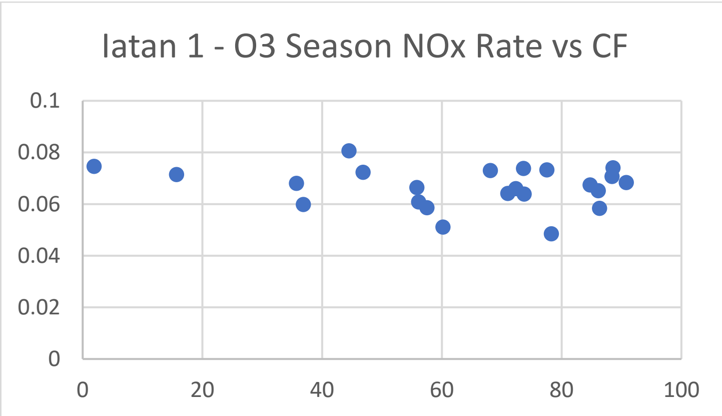
Missouri

Iatan 1: Unit 1 (726 MW) at the Iatan plant was analyzed. This unit has SCR installed. It can achieve reliably lower NOx emission rates below 0.06 lb/MMBtu. It is not operating its SCR consistently in accordance with the SCR's demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Iatan	1	726	0.0435	0.2000	0.0805
Iatan	2	914	0.0454	0.0595	0.0595

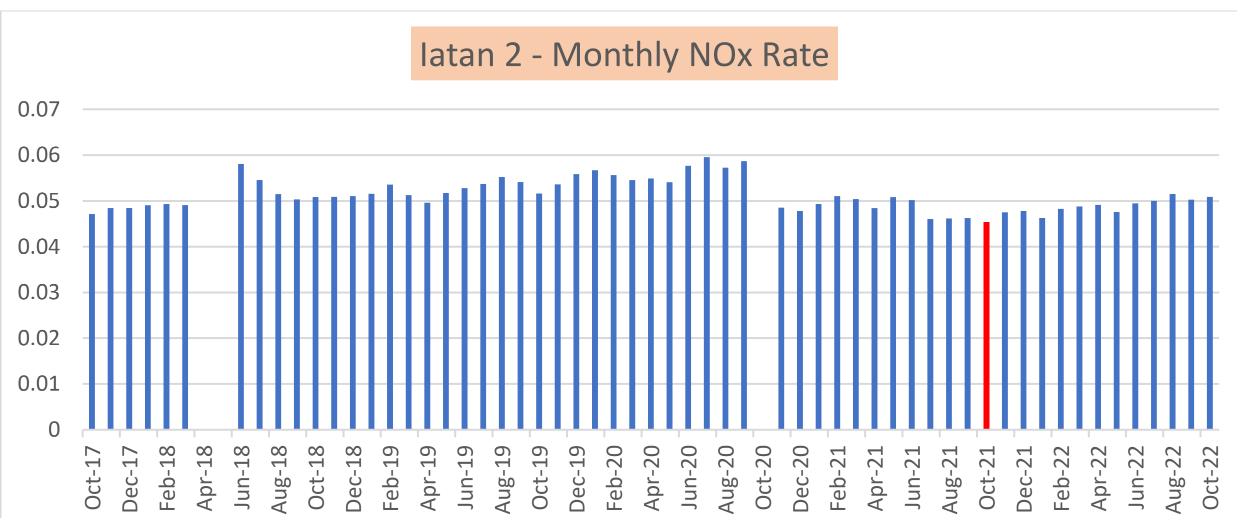


The chart above confirms that Iatan Unit 1 has achieved levels below 0.06 lb/MMBtu on several months of recent operation, with a low of .0435 lb/MMBtu, shown in red. The chart below shows that Iatan Unit 1 has achieved less than 0.06 lb/MMBtu over a wide range of ozone-season operating capacity factors.

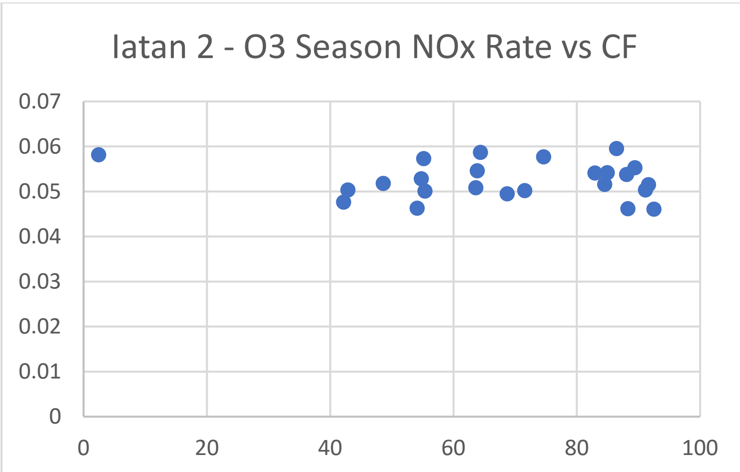


Iatan 2: Unit 2 (914 MW) at the Iatan plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu and has consistently done so from November 2020 through July 2022 excepting two months. It is not operating its SCR consistently in accordance with the SCR's lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Iatan	1	726	0.0435	0.2000	0.0805
Iatan	2	914	0.0454	0.0595	0.0595

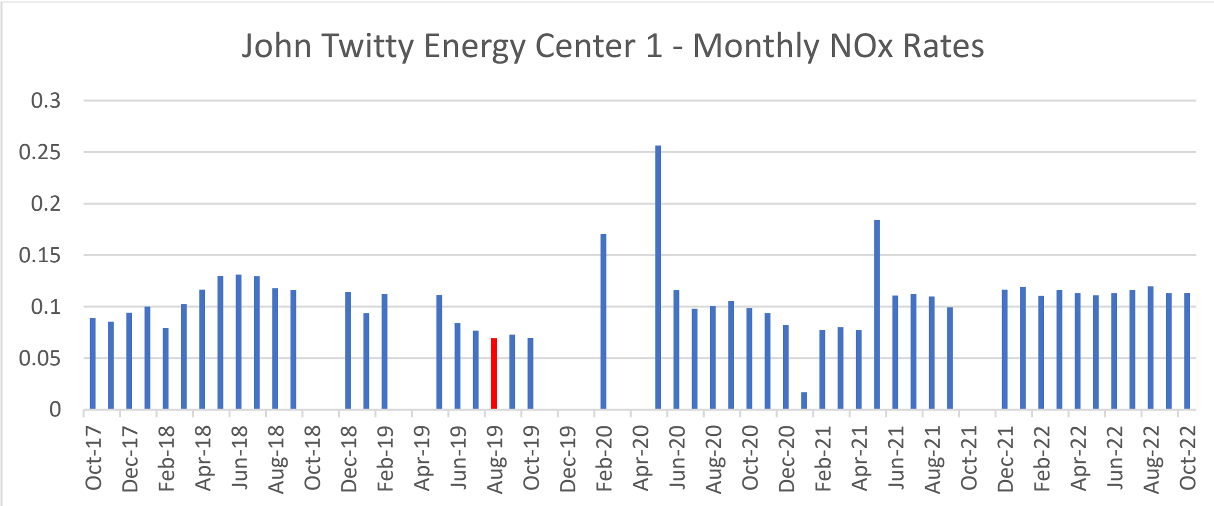


The chart above confirms that Iatan Unit 2 has achieved levels below 0.05 lb/MMBtu on many months of recent operation, with a low of 0.0454 lb/MMBtu, shown in red. The chart below shows that Iatan Unit 2 has achieved less than 0.05 lb/MMBtu over a wide range of ozone-season operating capacity factors.

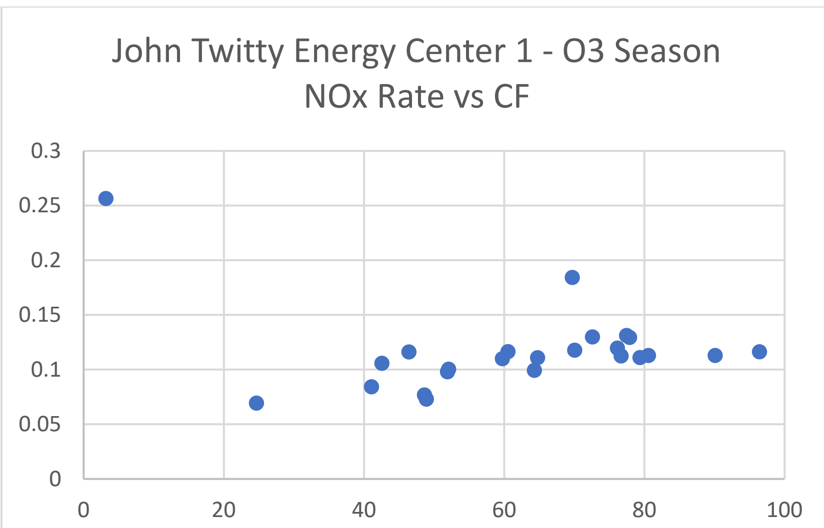


JTEC 1: Unit 1 (194 MW) at the John Twitty Energy Center plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.08 lb/MMBtu as demonstrated by its operation in 2019. It has wildly variable monthly NOx emission rates, ranging from above 0.25 lb/MMBtu at a high to 0.069 lb/MMBtu at a low. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. Indeed, it reliably emitted above 0.1 lb/MMBtu in late 2021 and 2022, significantly above its lowest demonstrated NOx reduction capacity achieved in 2019 of below 0.08 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
John Twitty Energy Center	1	194	0.0693	0.2564	
John Twitty Energy Center	2	300	0.0637	0.0899	

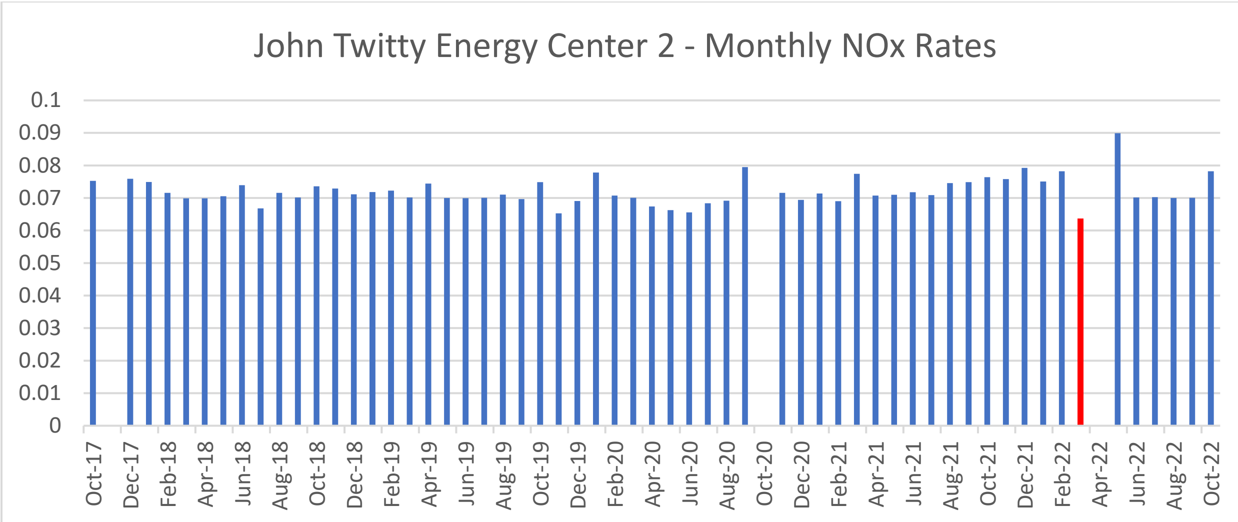


The chart above confirms that John Twitty Energy Center Unit 1 has consistently achieved levels below 0.08 lb/MMBtu on several months of recent operation, with a low of .0693 lb/MMBtu, shown in red. The chart below shows that John Twitty Energy Center Unit 1 has achieved less than 0.08 lb/MMBtu over a range of ozone-season operating capacity factors.

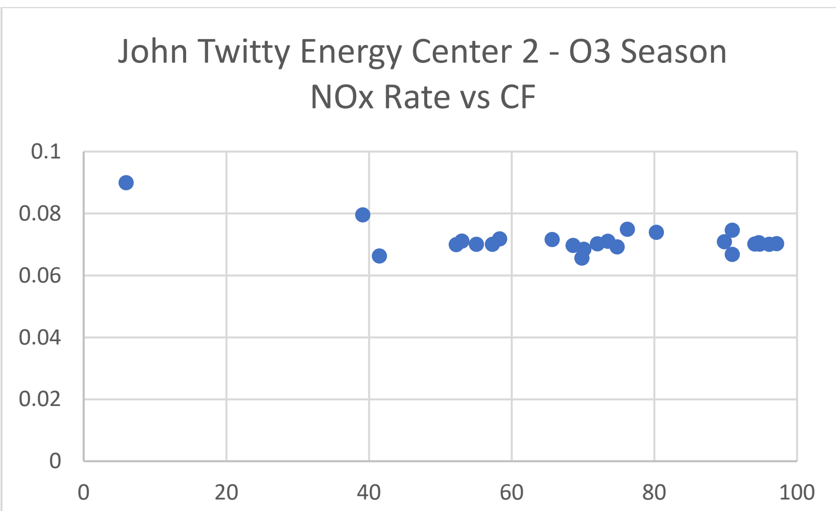


JTEC 2: Unit 2 (300 MW) at the John Twitty Energy Center plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emissions rates at or below 0.07 lb/MMBtu. It is not operating consistent with its lowest demonstrated NOx reduction capacity.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
John Twitty Energy Center	1	194	0.0693	0.2564	
John Twitty Energy Center	2	300	0.0637	0.0899	

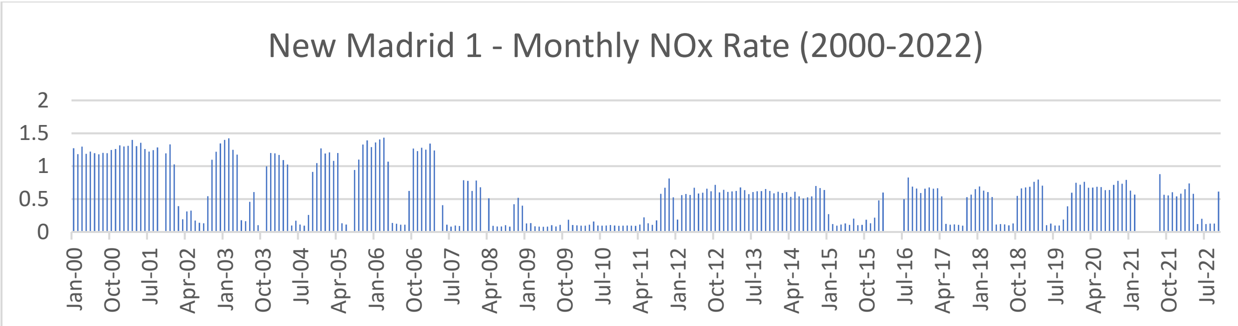


The chart above confirms that John Twitty Energy Center Unit 2 has achieved levels below 0.07 lb/MMBtu on several months of recent operation, with a low of .0637 lb/MMBtu, shown in red. The chart below shows that John Twitty Energy Center Unit 2 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

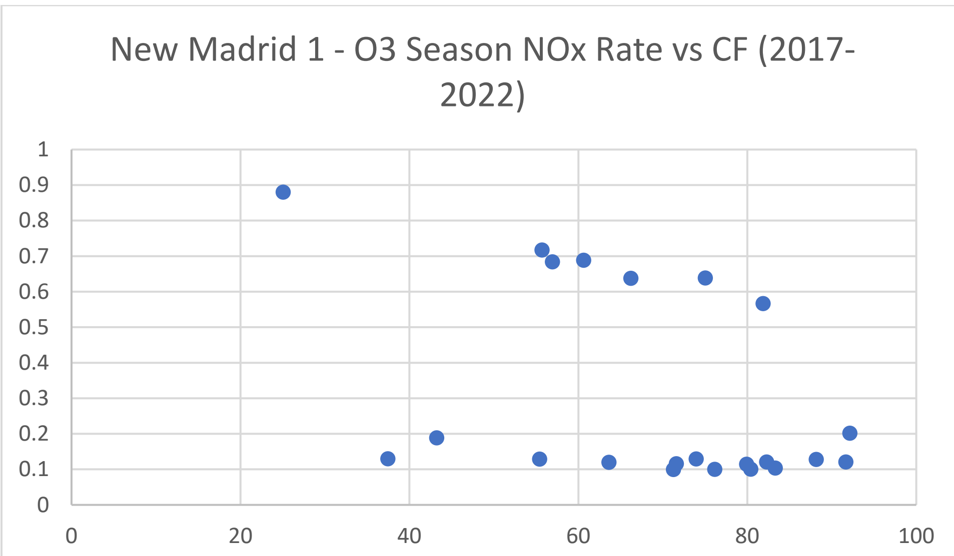


New Madrid 1: Unit 1 (600 MW) at the New Madrid plant was analyzed. This unit has SCR installed. Its NOx emissions rates are wildly variable. The unit can reliably achieve NOx emission rates below 0.10 lb/MMBtu. It is clearly not operating its SCR according to the SCR's NOx reduction capacity. During some ozone seasons, it is emitting at 0.87 lb/MMBtu, over 800% of its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below demonstrate.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
New Madrid	1	600	0.0991	0.08	0.8797	0.8797
New Madrid	2	600	0.1007	0.0764	1.0742	0.6420

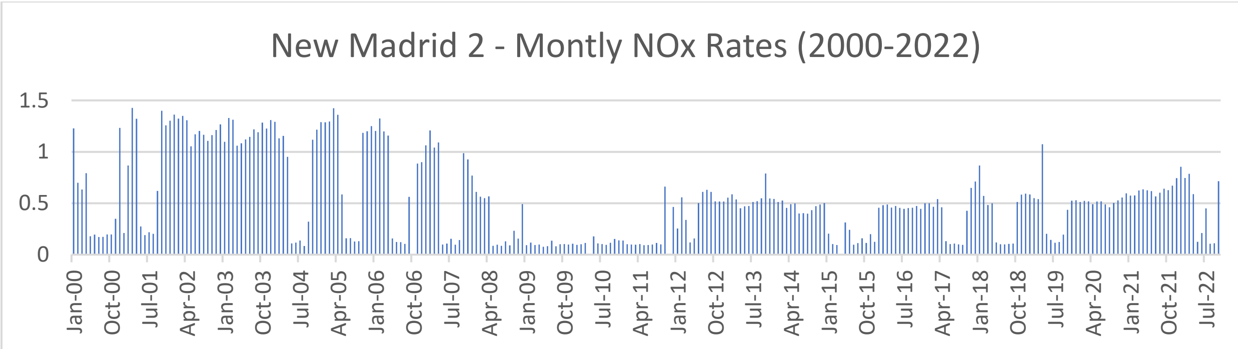


The chart above confirms that New Madrid 1 has reliably achieved levels below 0.10 lb/MMBtu, with a low of .0991 lb/MMBtu. The chart below shows that New Madrid Unit 1 has achieved levels less than approximately 0.10 lb/MMBtu over a range of ozone-season operating capacity factors.

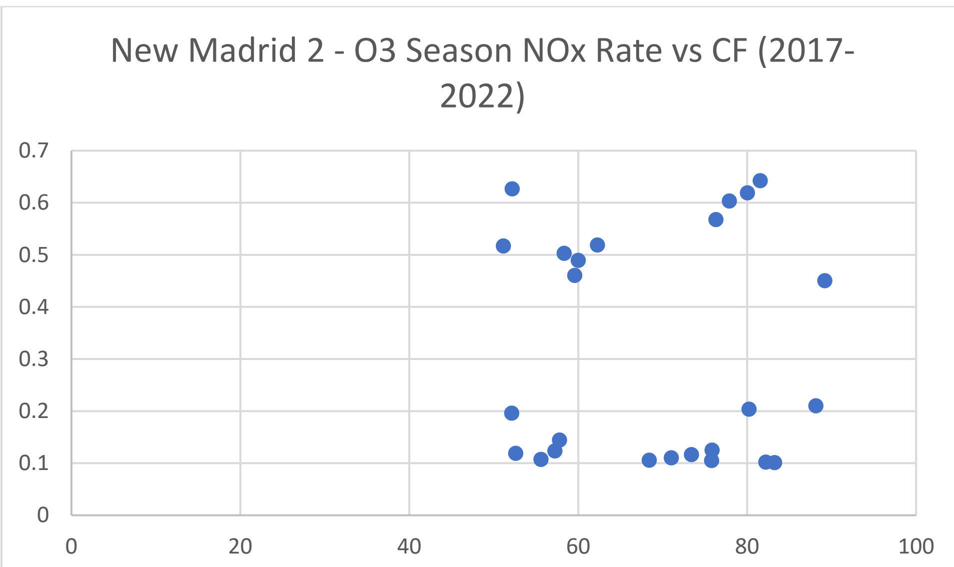


New Madrid 2: Unit 2 (600 MW) at the New Madrid plant was analyzed. Its NOx emissions rates are wildly variable. The unit can reliably achieve NOx emission rates below approximately 0.10 lb/MMBtu. It is clearly not operating its SCR according to the SCR's NOx reduction capacity. During some ozone seasons, it is emitting at 0.64 lb/MMBtu, over 600% of its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below demonstrate.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
New Madrid	1	600	0.0991	0.08	0.8797	0.8797
New Madrid	2	600	0.1007	0.0764	1.0742	0.6420

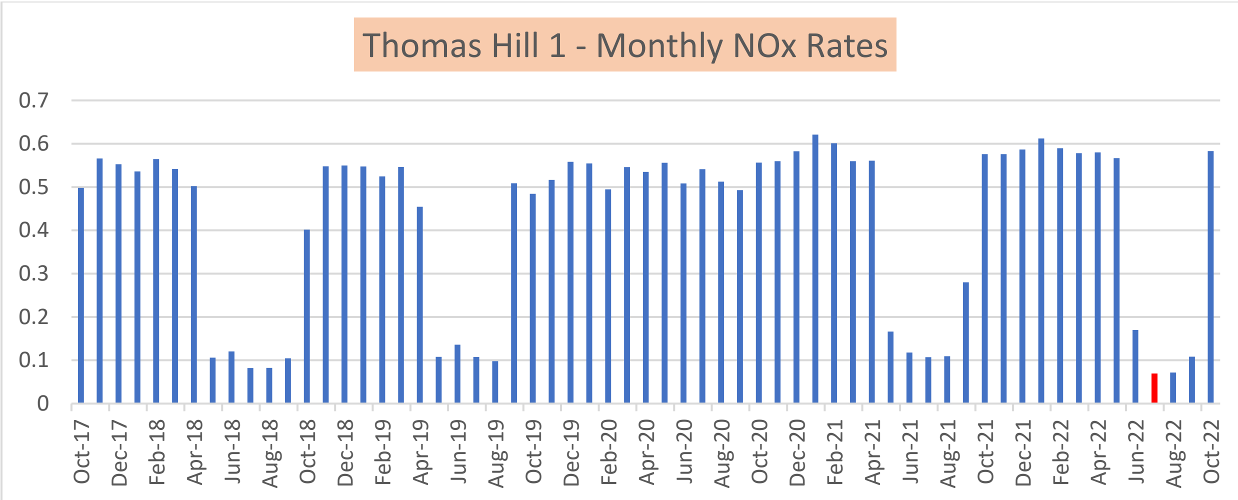


The chart above confirms that New Madrid 2 has reliably achieved levels of approximately 0.10 lb/MMBtu, with a low of .1007 lb/MMBtu. The chart below shows that New Madrid Unit 2 has achieved levels of approximately 0.10 lb/MMBtu over a range of ozone-season operating capacity factors.

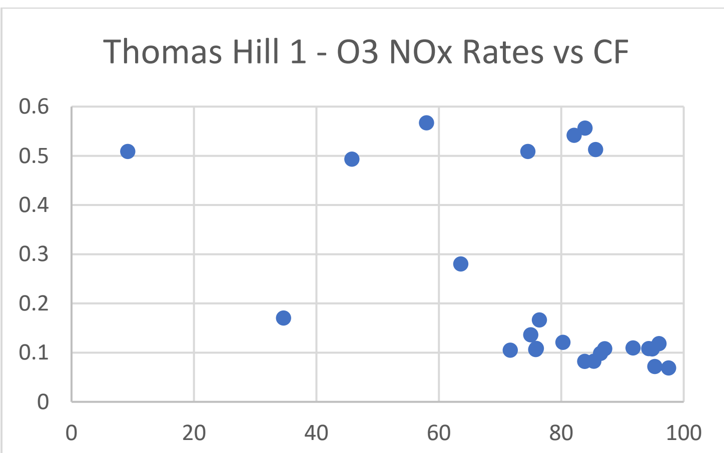


TH 1: Unit 1 (180 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

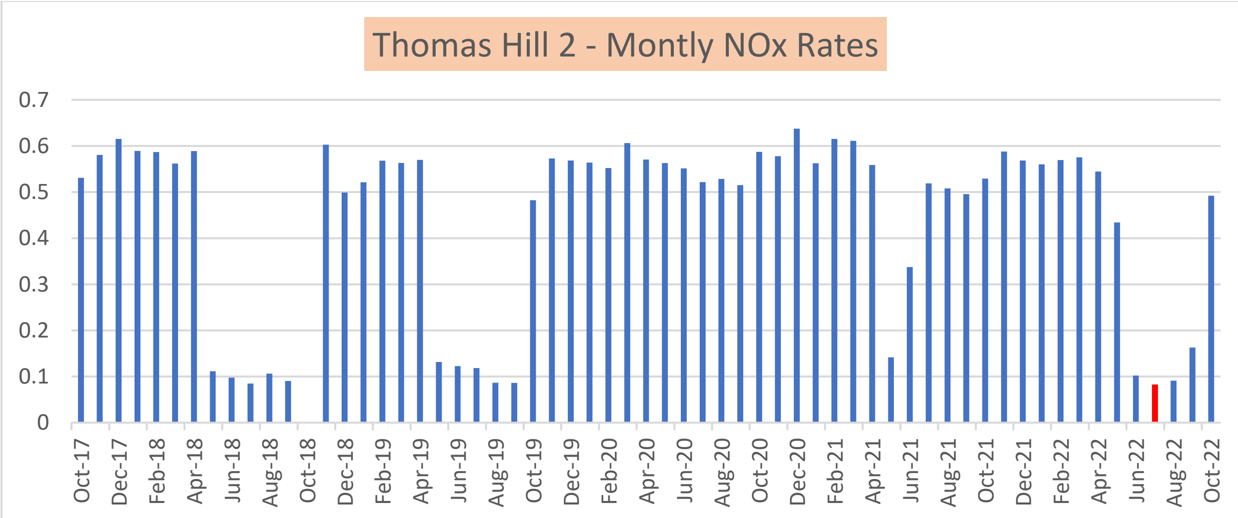


The chart above confirms that Thomas Hill 1 has reliably achieved levels below 0.10 lb/MMBtu, with a low of .0686 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 1 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

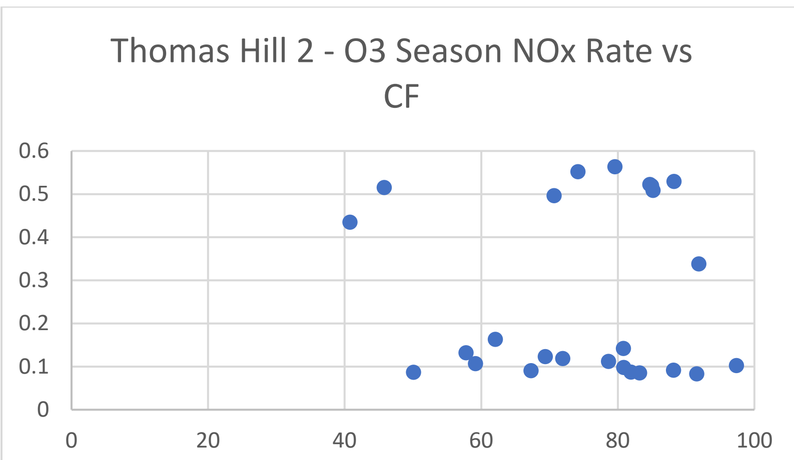


TH 2: Unit 2 (285 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

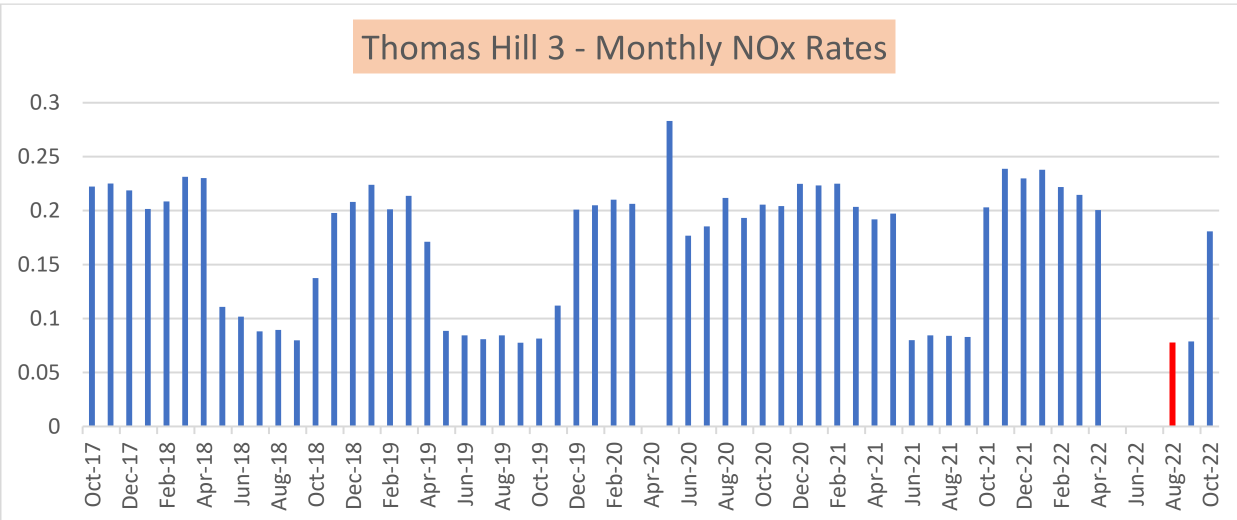


The chart above confirms that Thomas Hill 2 has achieved levels below 0.10 lb/MMBtu, with a low of .0825 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 2 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

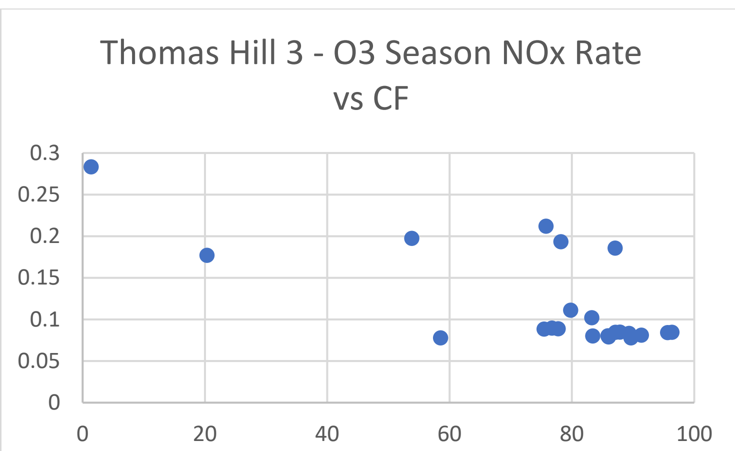


TH 3: Unit 3 (670 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

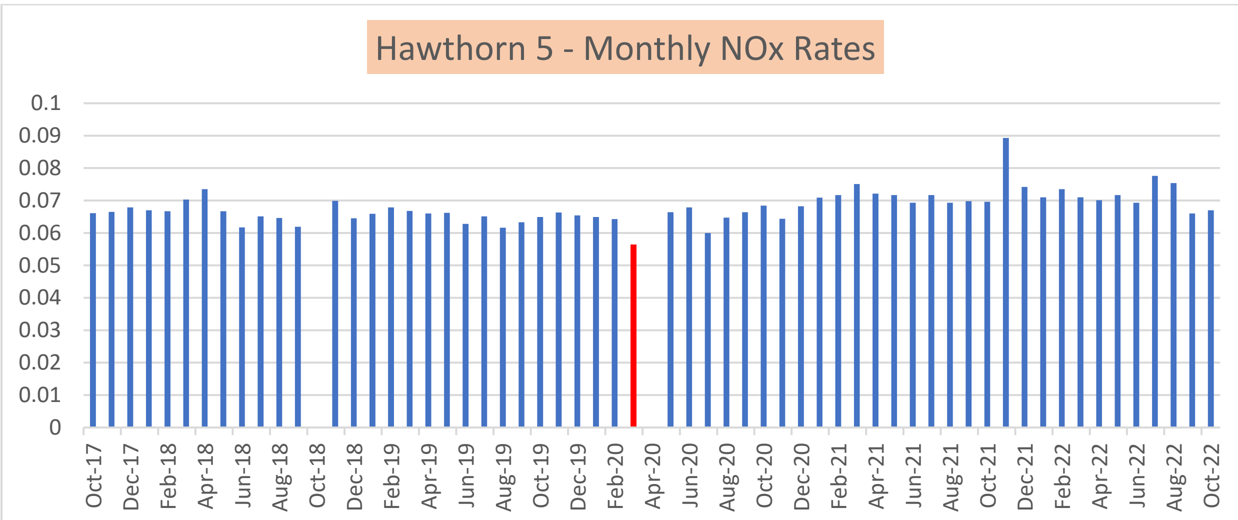


The chart above confirms that Thomas Hill 3 has achieved levels below 0.10 lb/MMBtu, with a low of .0775 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 3 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

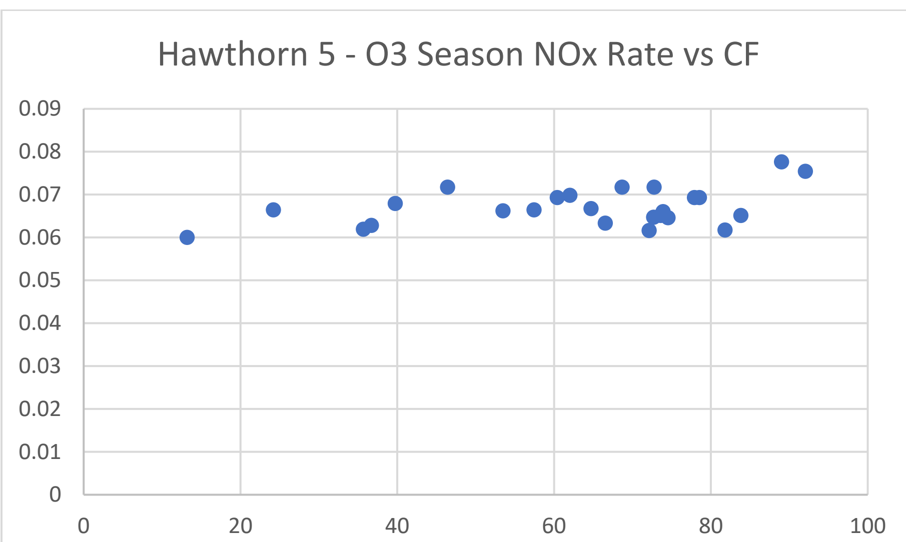


Hawthorn 5: Unit 5 (594 MW) at the Hawthorn plant was analyzed. It has SCR installed. The unit can reliably achieve NOx emissions rates of below 0.07 lb/MMBtu. It is not operating its SCR consistent with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Hawthorn	5	594	0.0563	0.0893	0.0776



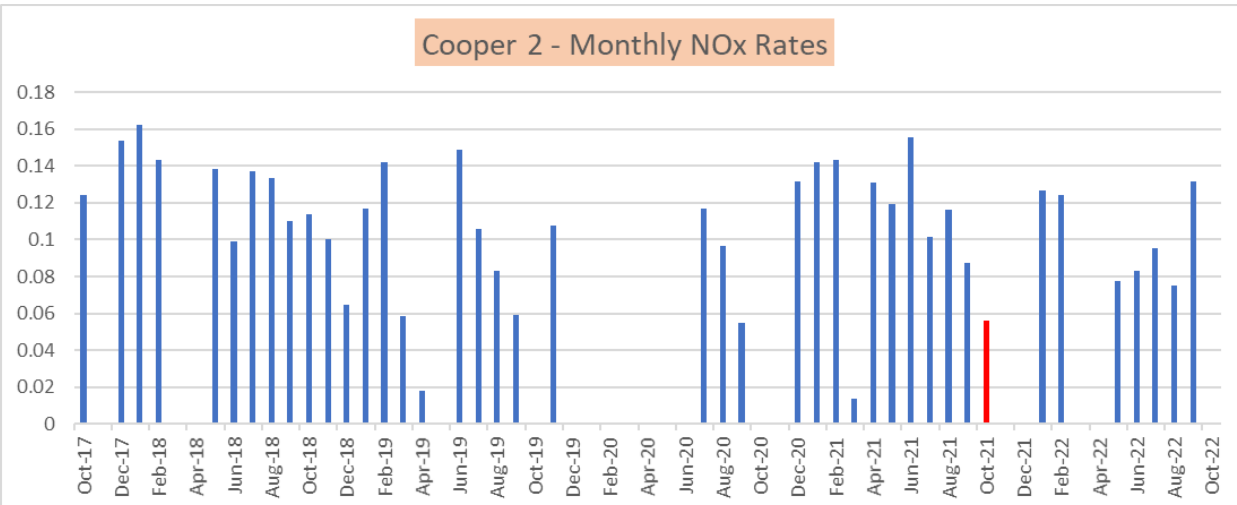
The chart above confirms that Hawthorn Unit 5 has achieved levels below 0.07 lb/MMBtu on many months of recent operation, with a low of 0.0563 lb/MMBtu, shown in red. The chart below shows that Hawthorn Unit 5 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.



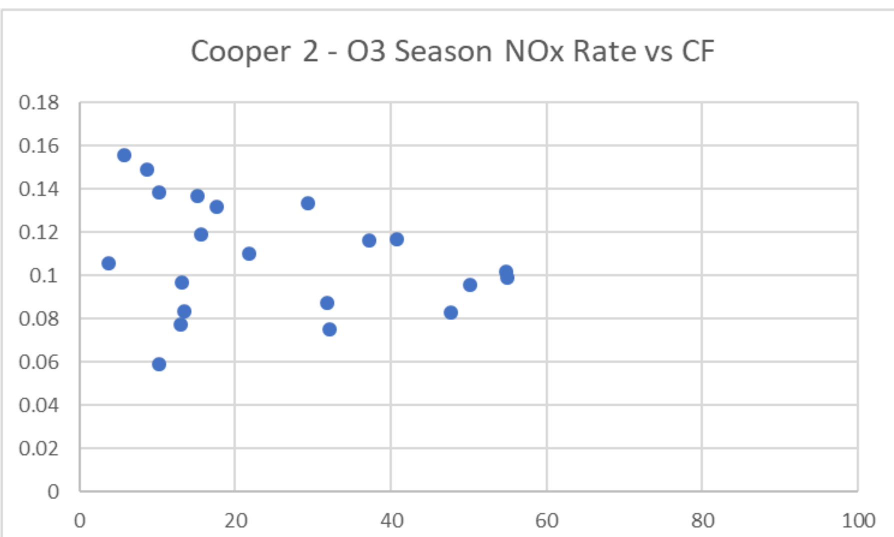
Kentucky

Cooper 2: Unit 2 (230 MW) at the Cooper plant was analyzed. It has SCR installed. It can achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emissions rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently according to the SCR's lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Cooper	2	230	0.0563	0.1625	0.1554

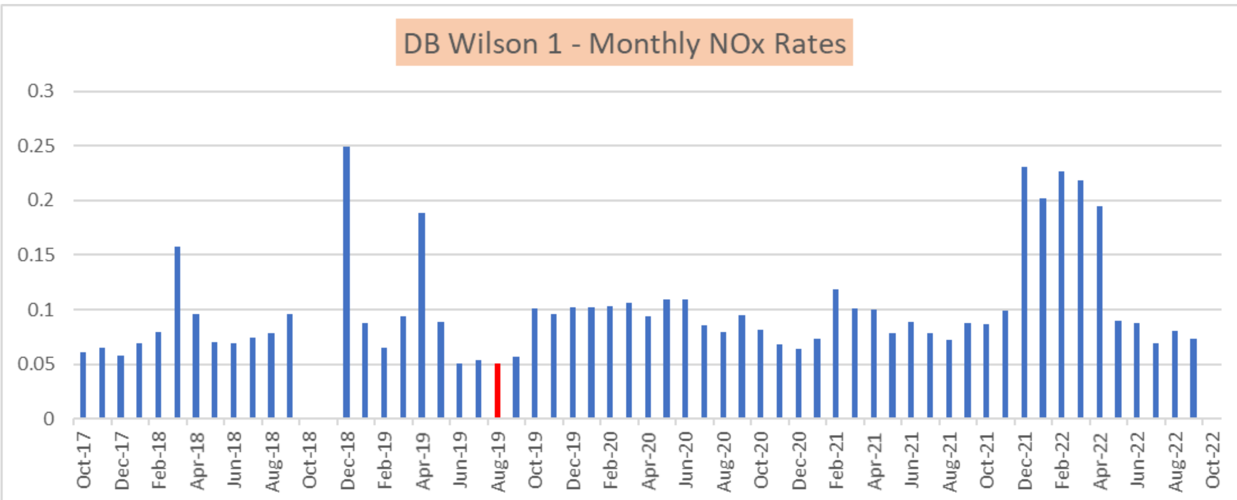


The chart above confirms that Cooper Unit 2 has achieved levels below 0.10 lb/MMBtu on many months of recent operation, with a low of 0.0563 lb/MMBtu, shown in red.

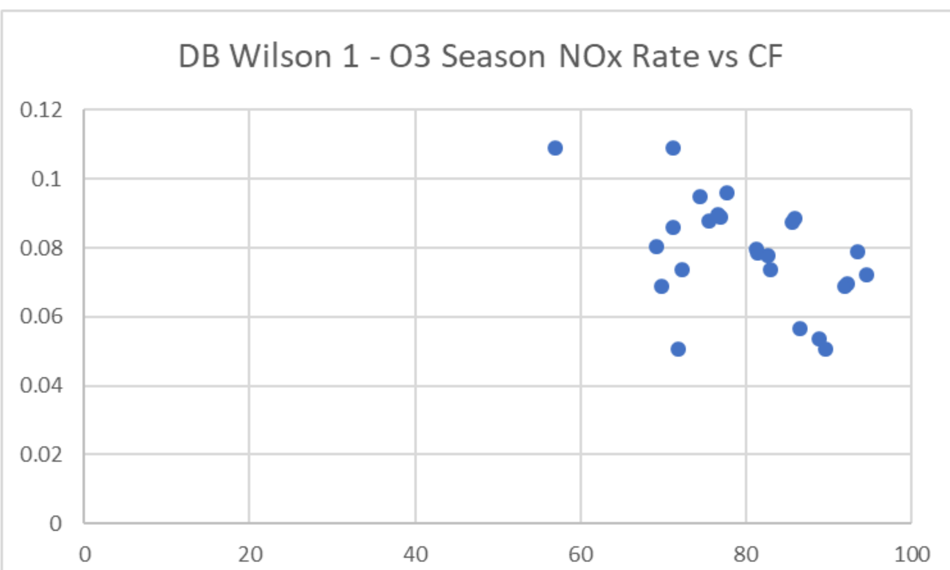


DB Wilson 1: Unit 1 (566 MW) at the DB Wilson plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of below 0.07 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
DB Wilson	1	566	0.0505	0.2491	0.1091

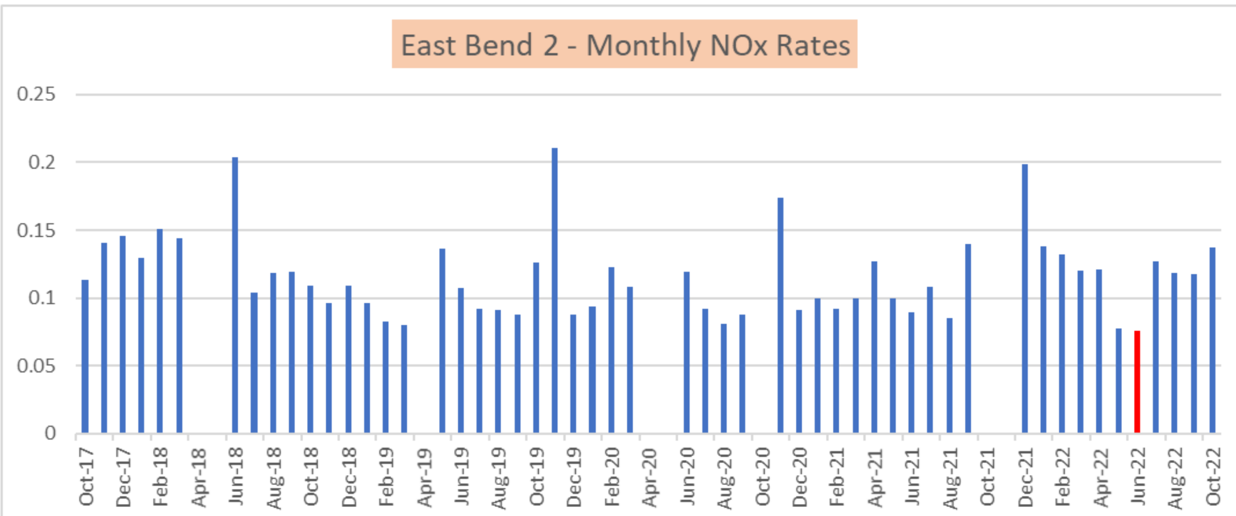


The chart above confirms that DB Wilson Unit 1 can reliably achieve levels below 0.07 lb/MMBtu on several months of operation, with a low of 0.0505 lb/MMBtu, shown in red. The chart below shows that DB Wilson Unit 1 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

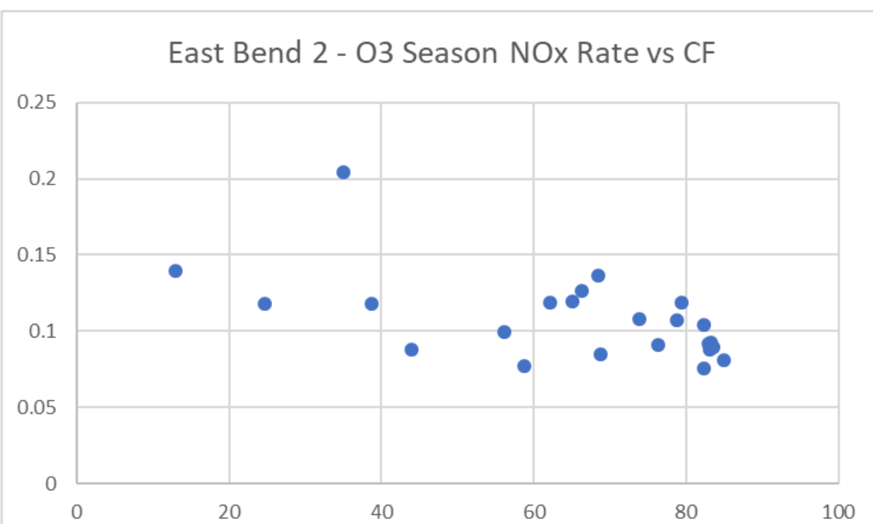


East Bend 2: Unit 2 (669 MW) at the East Bend plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
East Bend	2	669	0.0758	0.2110	0.2041

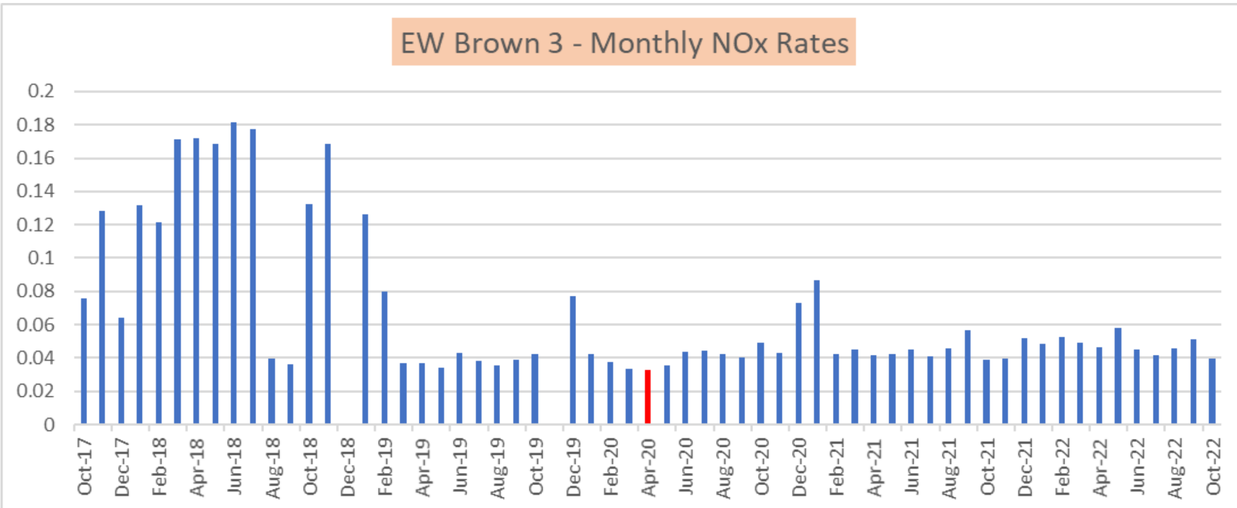


The chart above confirms that East Bend Unit 2 has regularly achieved levels of below 0.10 lb/MMBtu, with a low of 0.0758 lb/MMBtu, shown in red. The chart below shows that East Bend 2 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

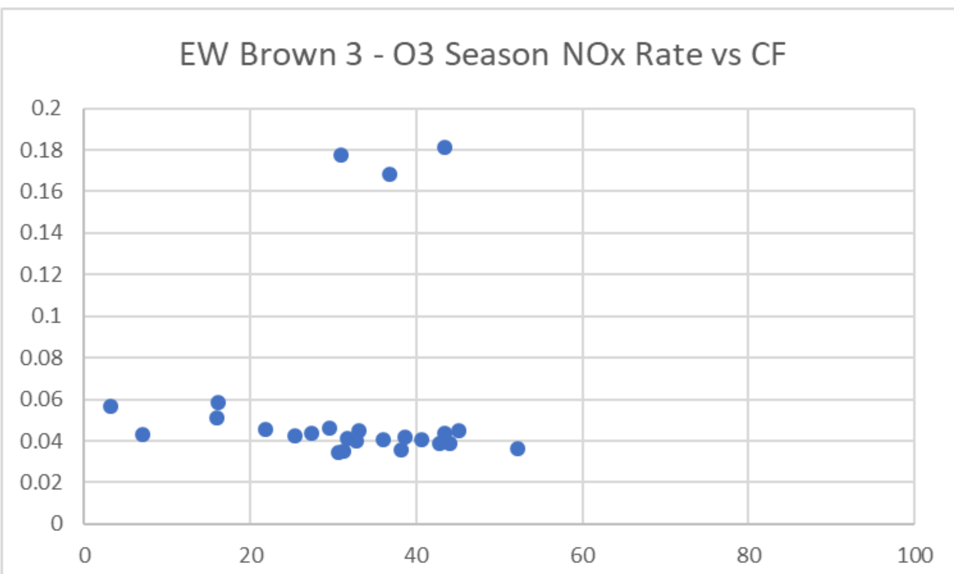


EW Brown 3: Unit 3 (464 MW) at the EW Brown plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of approximately 0.04 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
EW Brown	3	464	0.0326	0.1813	0.1813

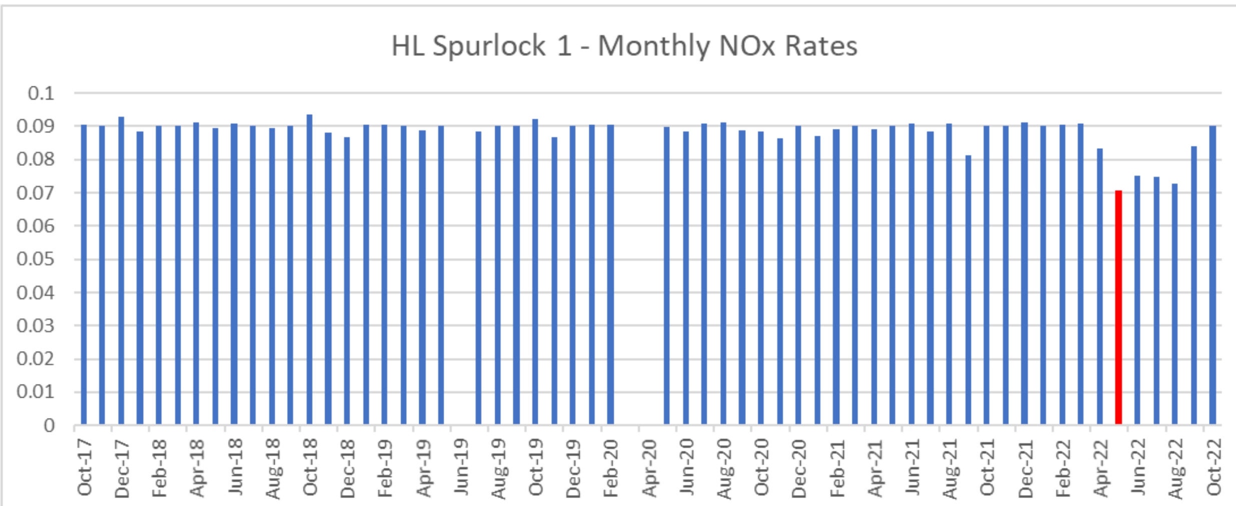


The chart above confirms that EW Brown Unit 3 has regularly achieved levels of approximately 0.04 lb/MMBtu, with a low of 0.0326 lb/MMBtu, shown in red. The chart below shows that EW Brown Unit 3 has achieved less than 0.04 lb/MMBtu over a wide range of ozone-season operating capacity factors.

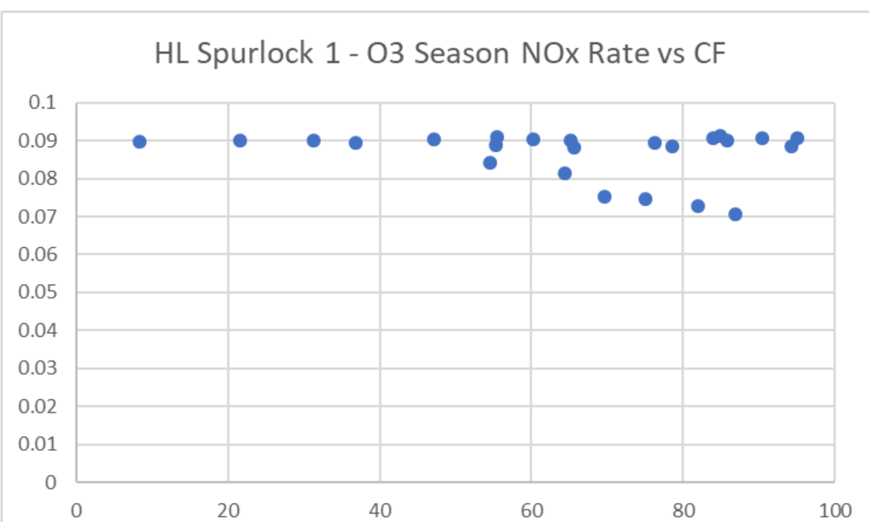


HL Spurlock 1: Unit 1 (385 MW) at the HL Spurlock plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.09 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
HL Spurlock	1	358	0.0707	0.0936	0.0912
HL Spurlock	2	592	0.0604	0.1290	0.0921

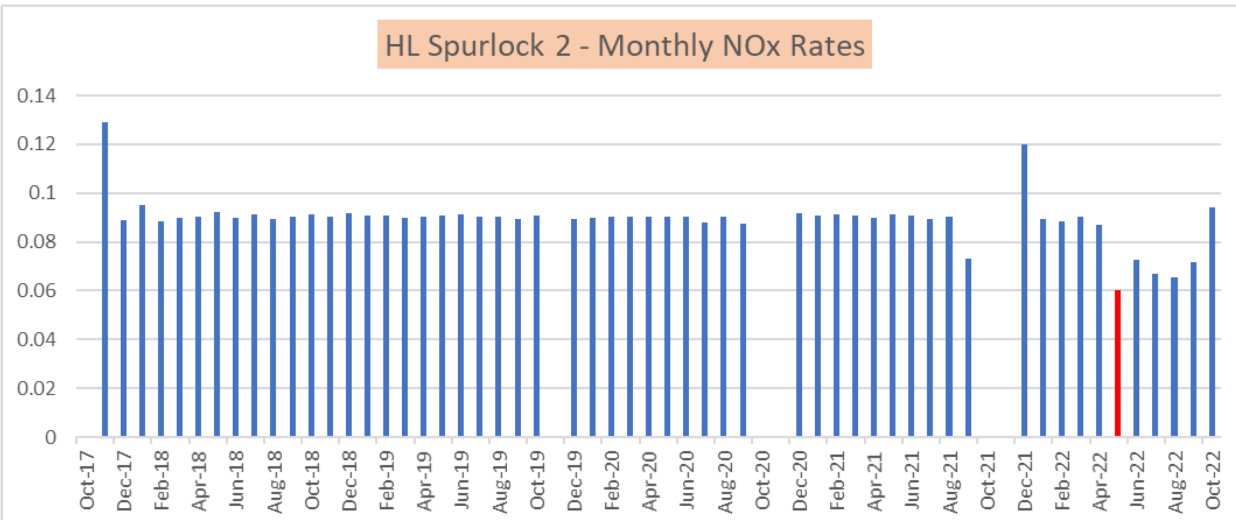


The chart above confirms that Spurlock Unit 1 reliably achieves NOx emissions of below 0.09 lb/MMBtu, and has maintained NOx emissions of below 0.08 lb/MMBtu during the 2022 ozone season, with a low of 0.0707 lb/MMBtu, shown in red. The chart below shows that Spurlock 1 has achieved less than 0.09 lb/MMBtu and below over a wide range of ozone-season operating capacity factors.

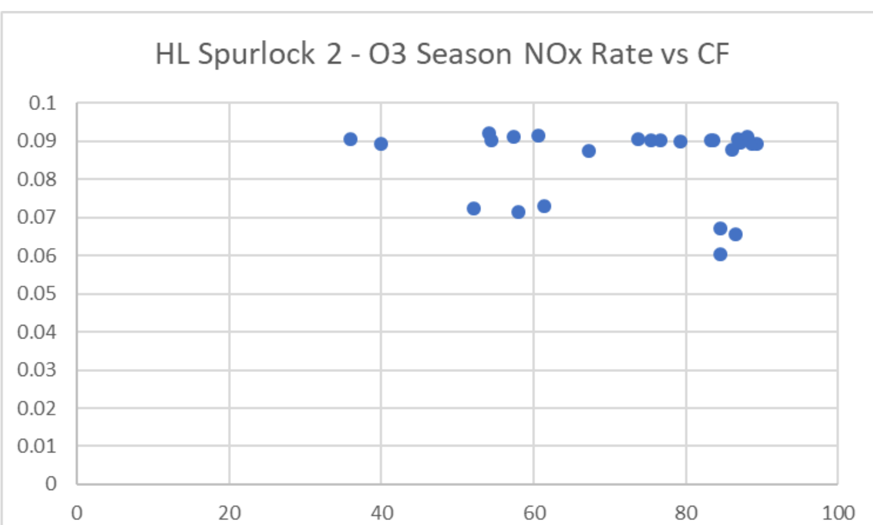


HL Spurlock 2: Unit 2 (592 MW) at the Spurlock 2 plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.09 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
HL Spurlock	1	358	0.0707	0.0936	0.0912
HL Spurlock	2	592	0.0604	0.1290	0.0921

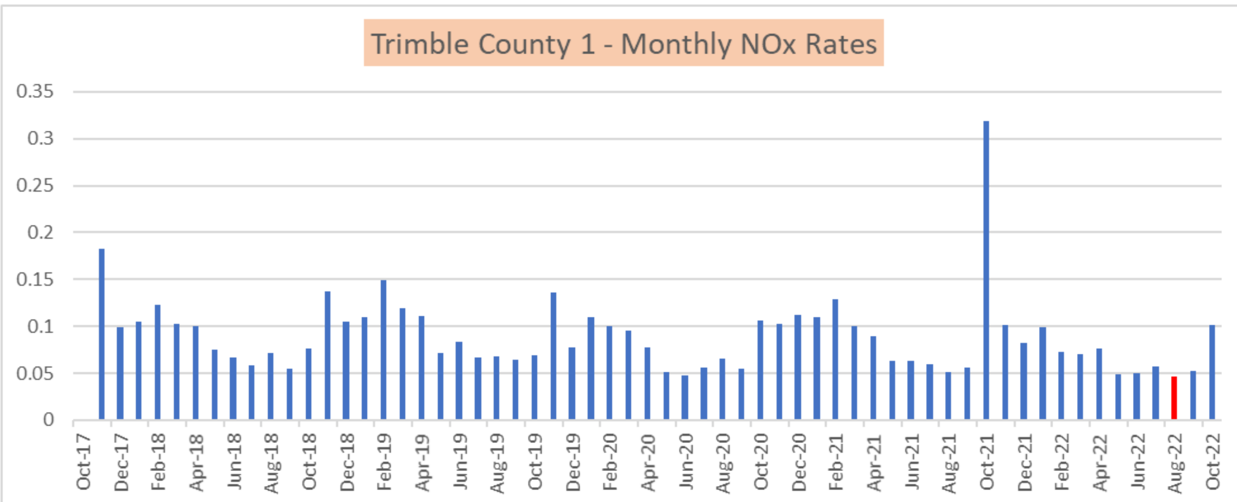


The chart above confirms that Spurlock Unit 2 reliably achieves NOx emissions of below 0.09 lb/MMBtu, and has maintained NOx emissions of below 0.08 lb/MMBtu during the 2022 ozone season, with a low of 0.0604 lb/MMBtu, shown in red. The chart below shows that Spurlock 2 has achieved less than 0.09 lb/MMBtu and below over a range of ozone-season operating capacity factors.

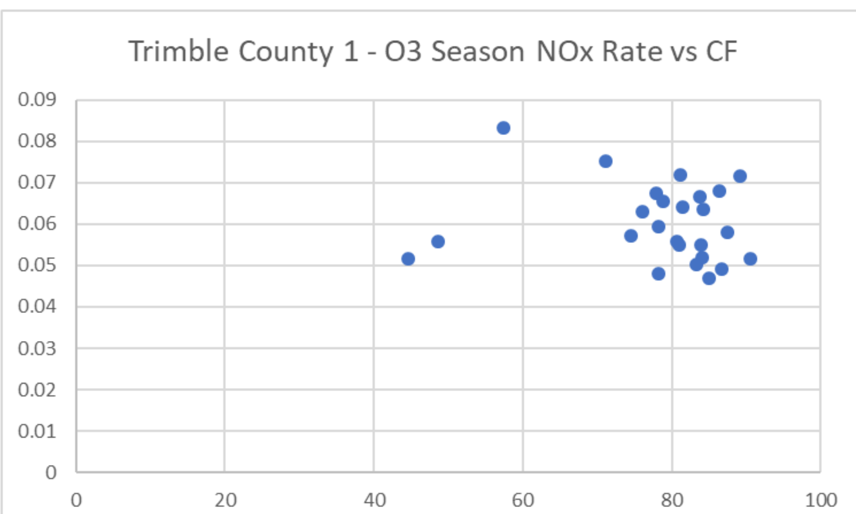


TC 1: Unit 1 (566 MW) at the Trimble County plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.07 lb/MMBtu and below, regularly achieving approximately 0.05 lb/MMBtu during ozone seasons 2022, 2021, and 2020. It is clearly not operating its SCR according to the SCR's NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Trimble County	1	566	0.0470	0.3192	0.0832
Trimble County	2	834	0.0257	0.3788	0.0757

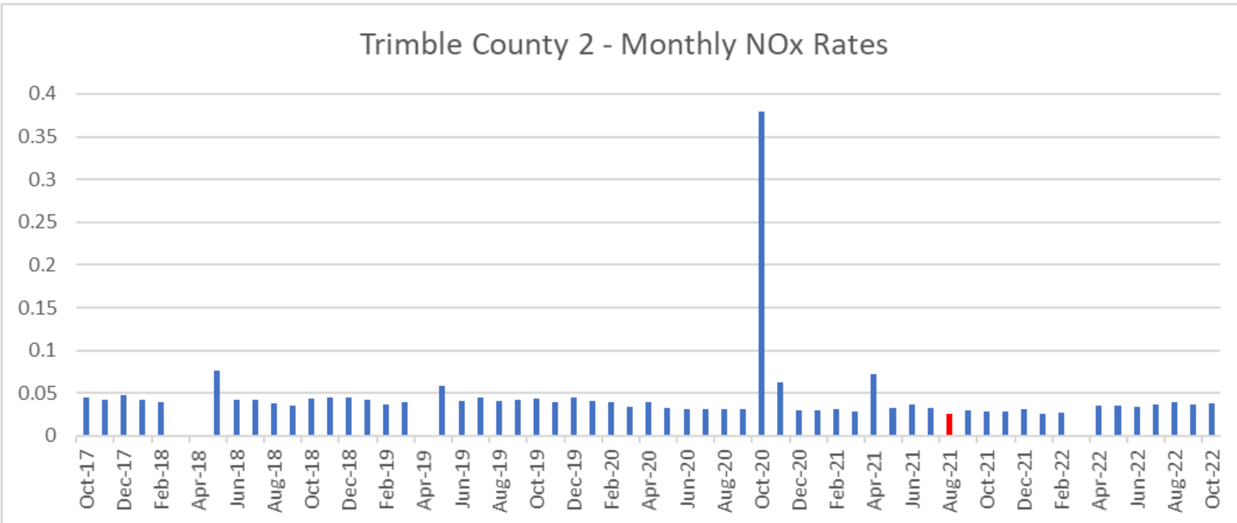


The chart above confirms that Trimble County 1 has achieved levels below 0.05 lb/MMBtu, with a low of .0470 lb/MMBtu, shown in red. The chart below shows that Trimble County 1 has achieved less than 0.05 lb/MMBtu over a range of ozone-season operating capacity factors.

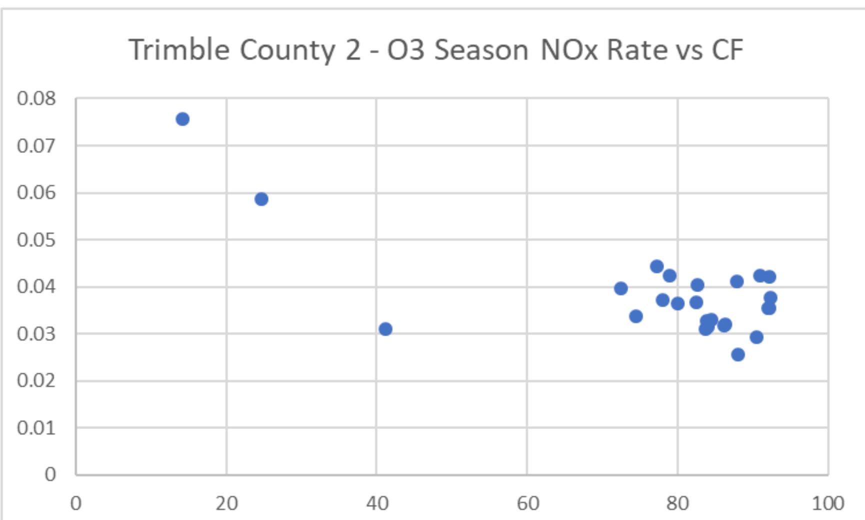


TC 2: Unit 2 (834 MW) at the Trimble County plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Trimble County	1	566	0.0470	0.3192	0.0832
Trimble County	2	834	0.0257	0.3788	0.0757

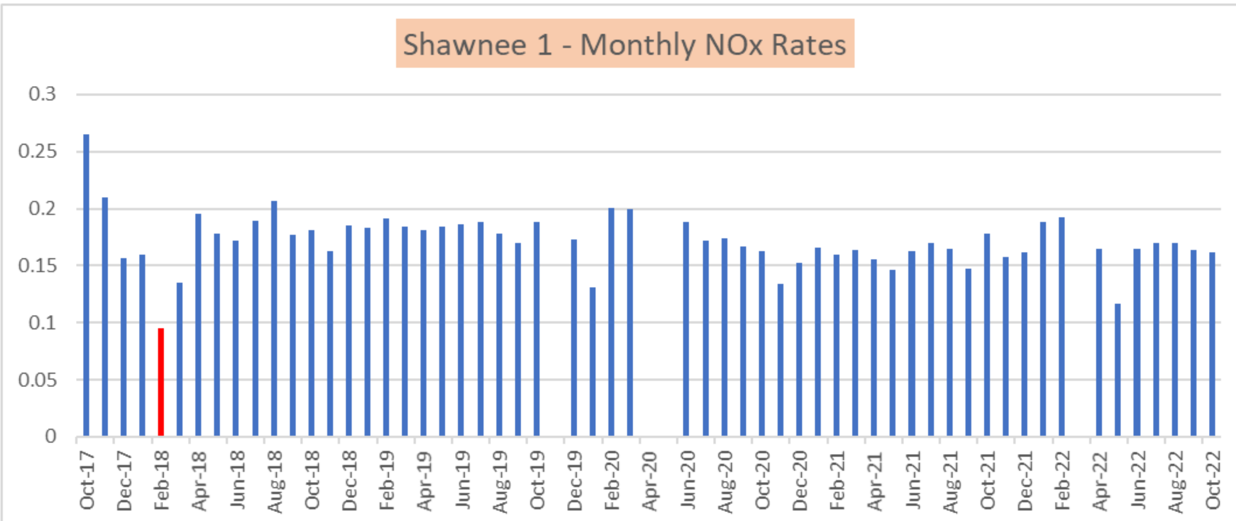


The chart above confirms that Trimble County 2 has often achieved levels well below 0.05 lb/MMBtu, with a low of .0257 lb/MMBtu, shown in red. The chart below shows that Trimble County 2 has achieved less than 0.05 lb/MMBtu over a range of ozone-season operating capacity factors.

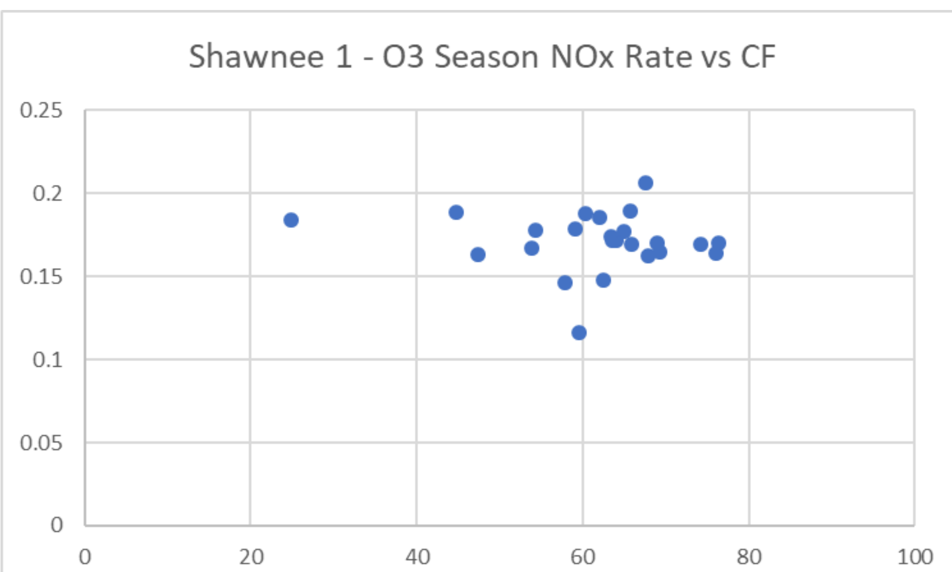


Shawnee 1: Unit 1 (175 MW) at the Shawnee plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Shawnee	1	175	0.0954	N/A	0.2655	0.2063
Shawnee	4	175	0.1045	0.1045	0.2517	0.2057

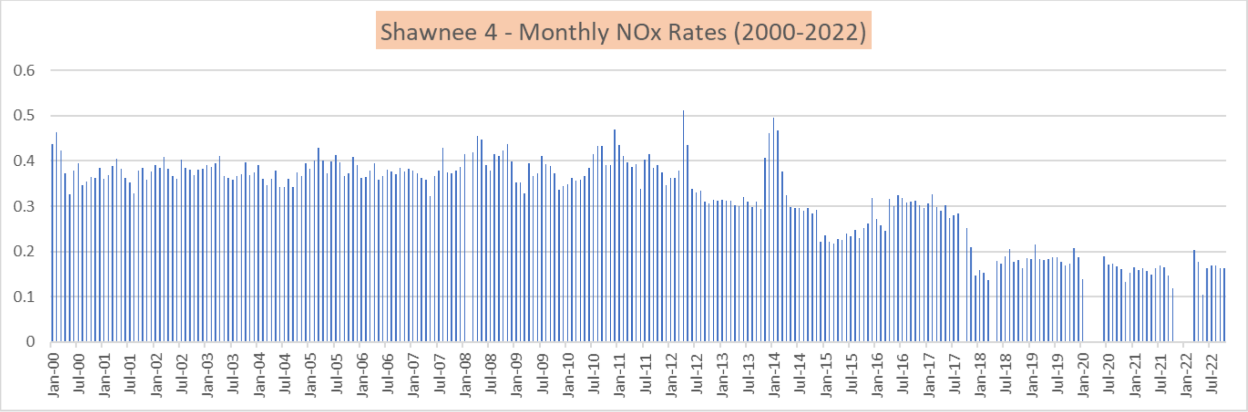


The chart above confirms that Shawnee 1 has consistently exceeded 0.15 lb/MMBtu, and on occasion has been shown to reduce NOx emissions rates to below 0.10 lb/MMBtu, with a low of .0954 lb/MMBtu, shown in red. The chart below shows that Shawnee 1's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

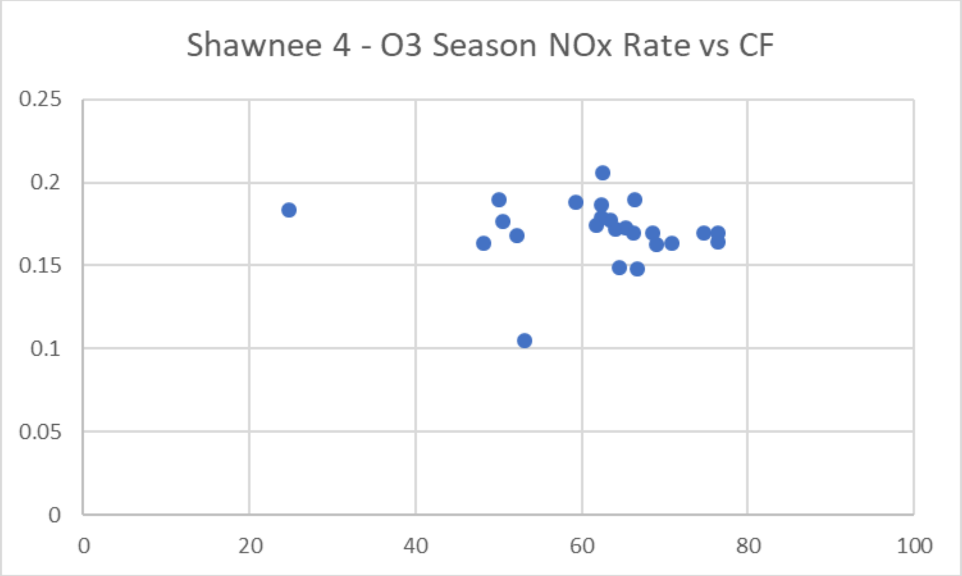


Shawnee 4: Unit 4 (175 MW) at the Shawnee plant. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Shawnee	1	175	0.0954	N/A	0.2655	0.2063
Shawnee	4	175	0.1045	0.1045	0.2517	0.2057

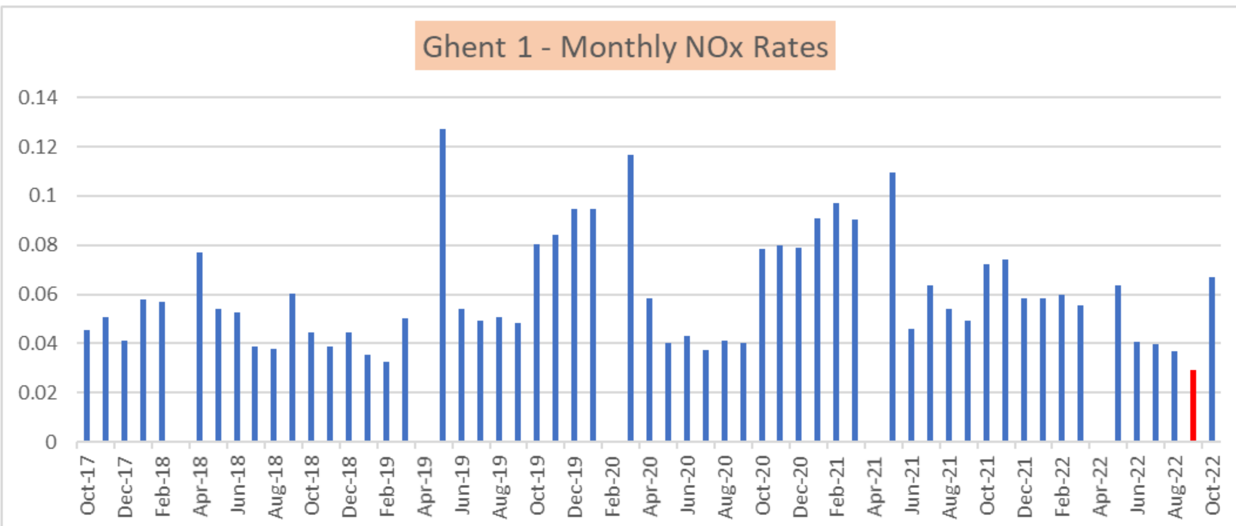


The chart above confirms that Shawnee 4 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .1045 lb/MMBtu, shown in red. The chart below shows that Shawnee 4's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

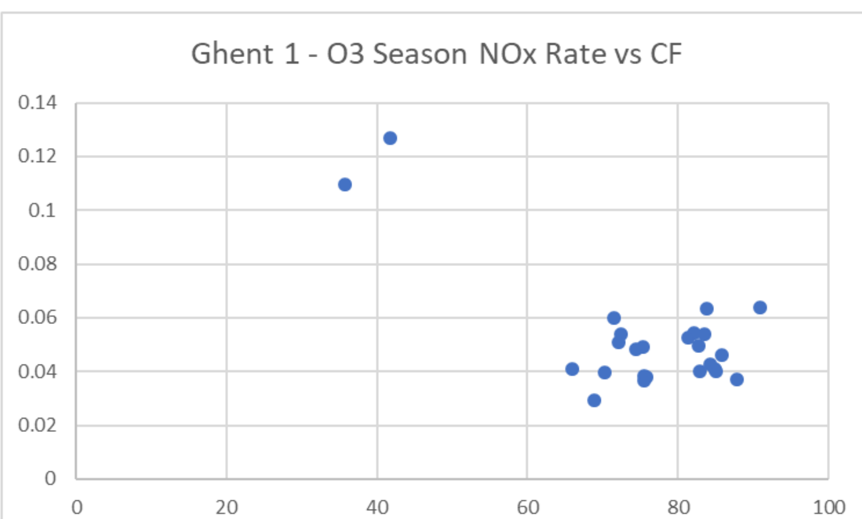


Ghent 1: Unit 1 (557 MW) at the Ghent plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of below 0.04 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capabilities, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

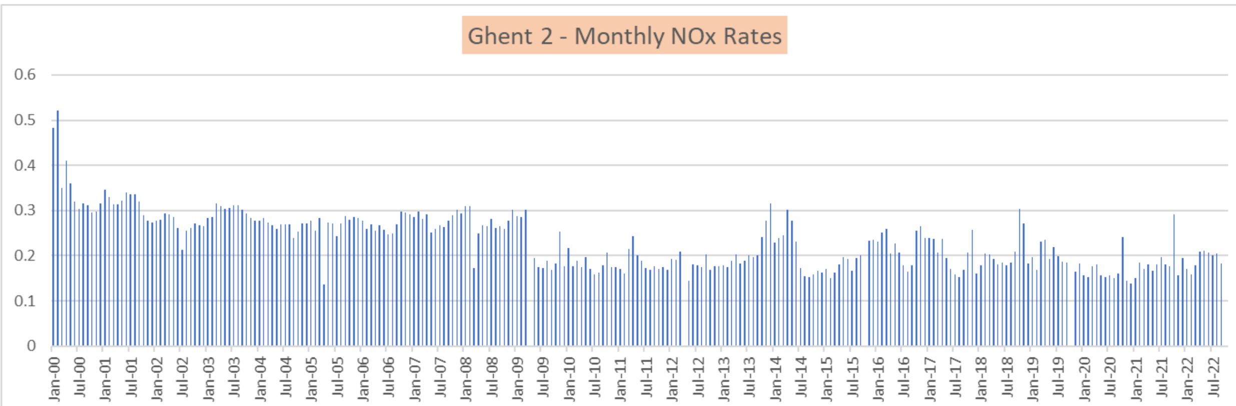


The chart above confirms that Ghent 1 has achieved levels below 0.04 lb/MMBtu, with a low of .0292 lb/MMBtu, shown in red. The chart below shows that Ghent 1 has achieved less than 0.04 lb/MMBtu over a range of ozone-season operating capacity factors.

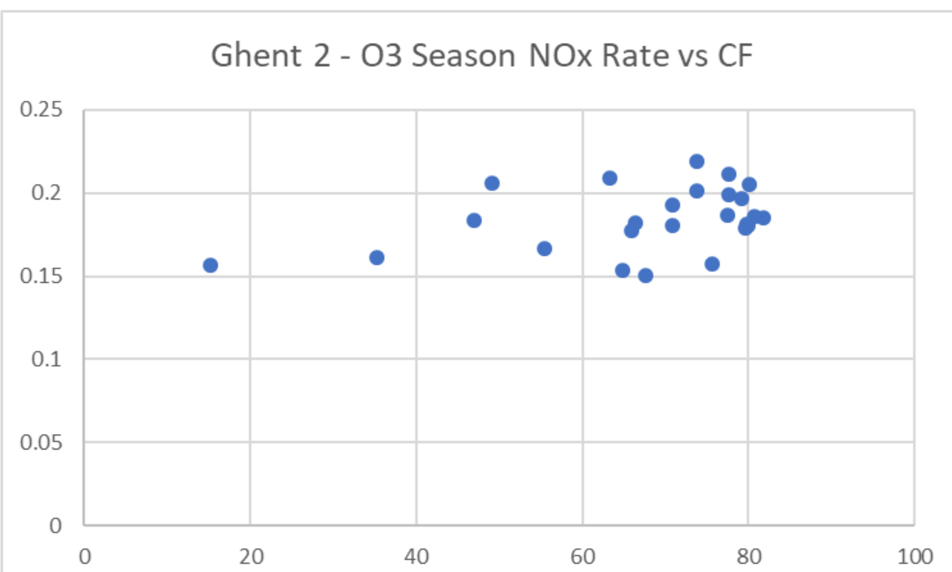


Ghent 2: Unit 2 (556 MW) at the Ghent plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

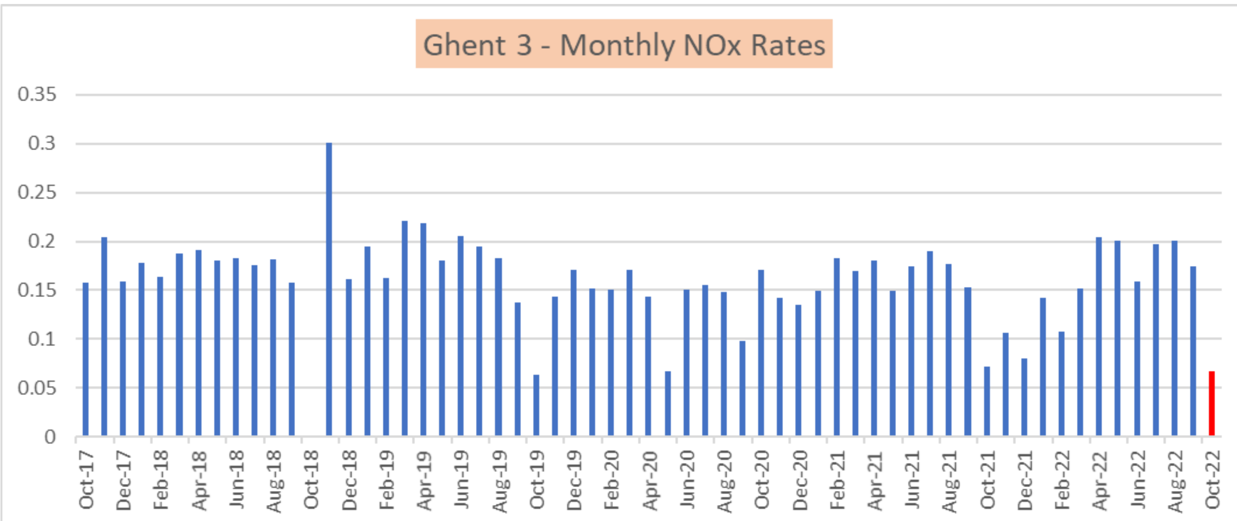


The chart above confirms that Ghent 2 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .1383 lb/MMBtu, shown in red. The chart below shows that Ghent 2's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

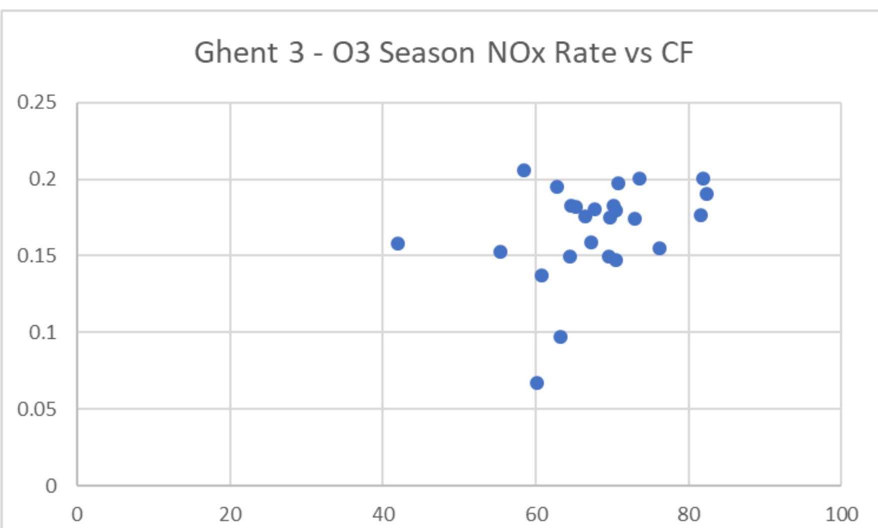


Ghent 3: Unit 3 (557 MW) at the Ghent plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

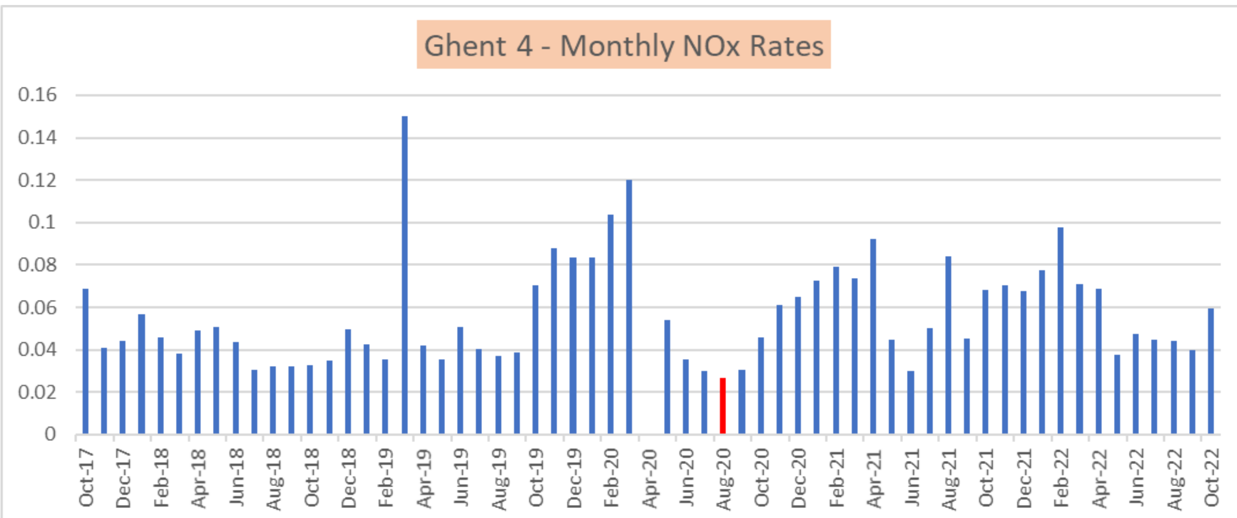


The chart above confirms that Ghent 3 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .0627 lb/MMBtu, shown in red. The chart below shows that Ghent 3's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

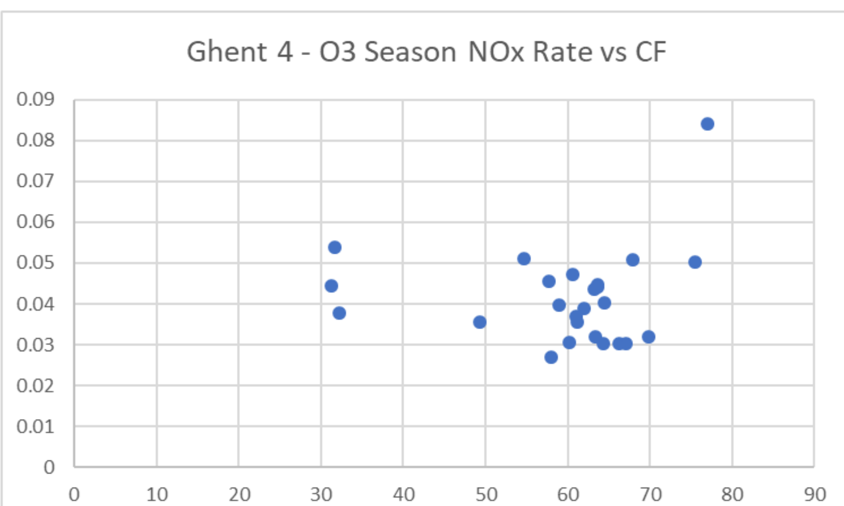


Ghent 4: Unit 3 (556 MW) at the Ghent plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates below 0.04 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842



The chart above confirms that Ghent 4 has often achieved levels below 0.04 lb/MMBtu, with a low of .0268 lb/MMBtu, shown in red. The chart below shows that Ghent 4 has achieved less than 0.04 lb/MMBtu over a wide range of ozone-season operating capacity factors.



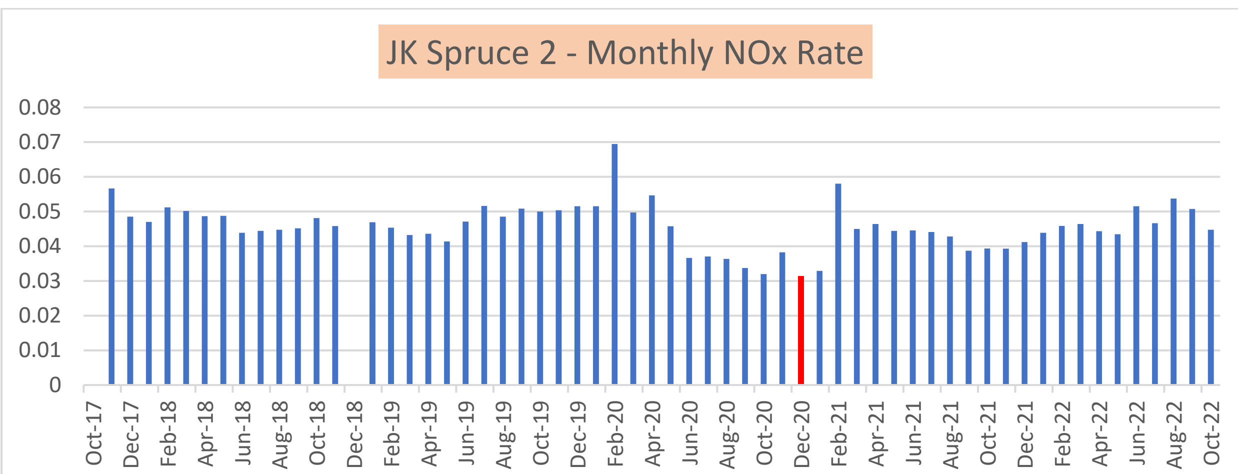
ATTACHMENT 3

NOx Emission Rates at Selected Coal Fired Electricity Generating Units with SCR

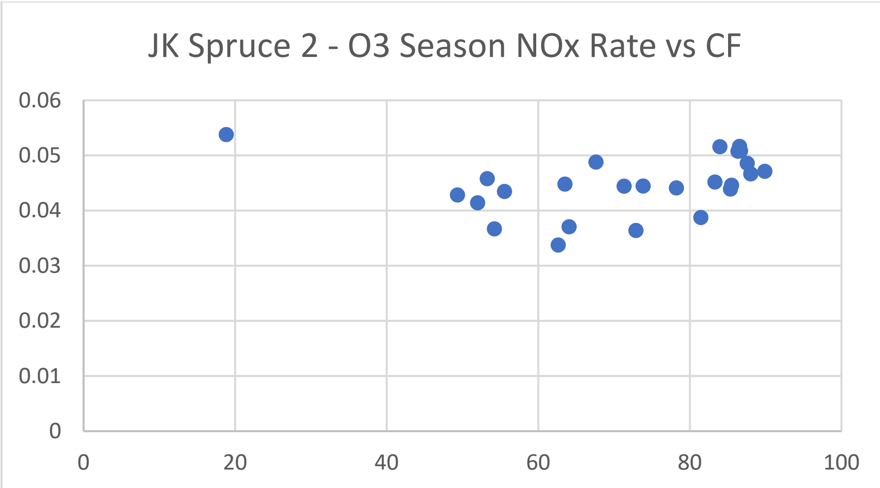
Texas

JK Spruce Unit 2: Unit 2 (878 MW) at the JK Spruce plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates of below 0.04 lb/MMBtu. This unit is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
JK Spruce	2	878	0.0313	0.0695	0.0537

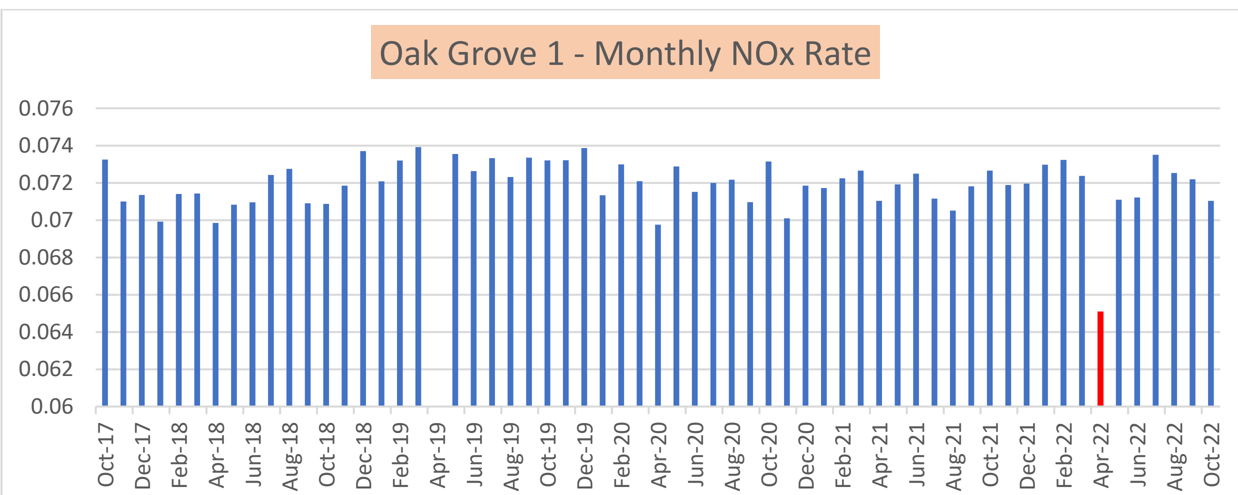


The chart above confirms that JK Spruce Unit 2 has achieved levels below 0.04 lb/MMBtu, with a low of 0.0313 lb/MMBtu, shown in red. The chart below shows that JK Spruce Unit 2 has achieved less than 0.04 lb/MMBtu over a range of ozone-season operating capacity factors.

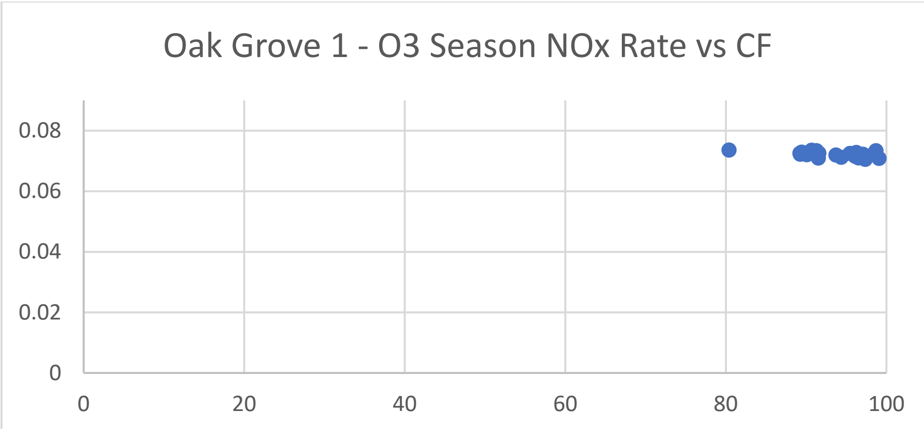


Oak Grove 1: Unit 1 (917 MW) at the Oak Grove plant was analyzed. This unit has SCR installed. It can achieve slightly lower NOx emission rates. It is not operating its SCR consistently according to the SCR's NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Oak Grove	1	917	0.0651	0.0739	0.0736
Oak Grove	2	879	0.0690	0.1117	0.0753

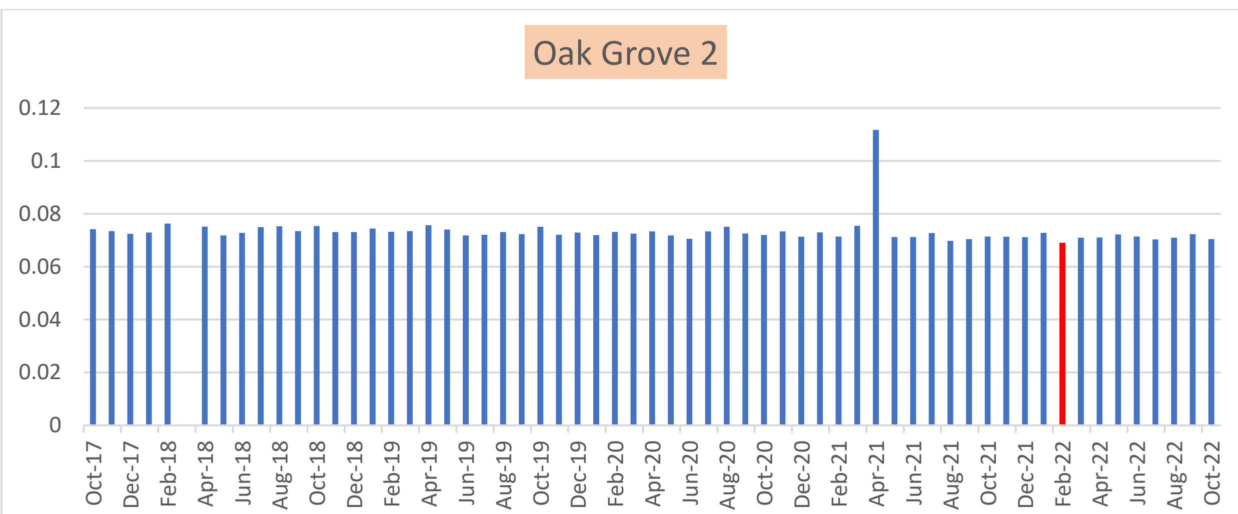


The chart above confirms that Oak Grove Unit 1 has achieved levels below 0.07 lb/MMBtu on several months of recent operation, with a low of 0.0651 lb/MMBtu, shown in red. The chart below shows that Oak Grove Unit 1 has achieved approximately 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

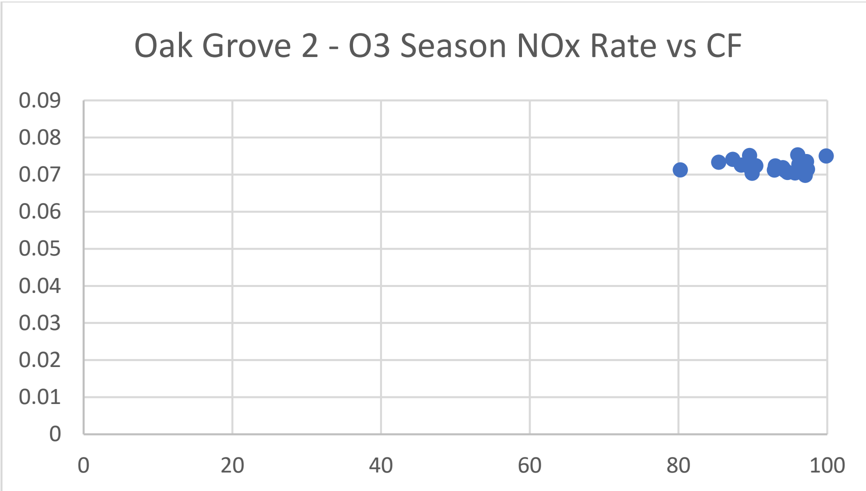


Oak Grove 2: Unit 2 (879 MW) at the Oak Grove plant was analyzed. This unit has SCR installed. It may be able to achieve slightly lower NOx emission rates.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Oak Grove	1	917	0.0651	0.0739	0.0736
Oak Grove	2	879	0.0690	0.1117	0.0753

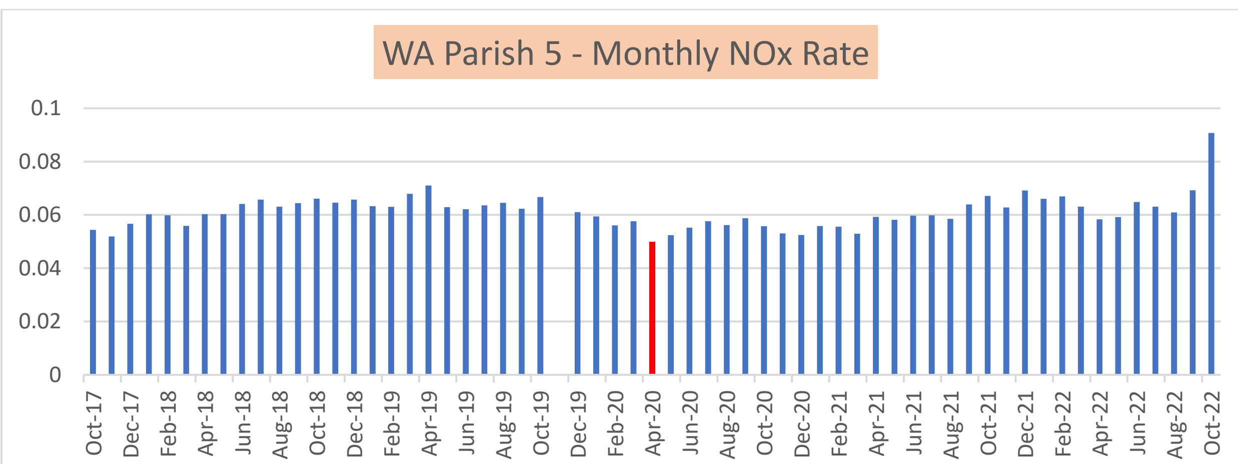


The chart above confirms that Oak Grove Unit 2 regularly achieves NOx emissions rates of approximately 0.07 lb/MMBtu, with a low of 0.0690 lb/MMBtu, shown in red.

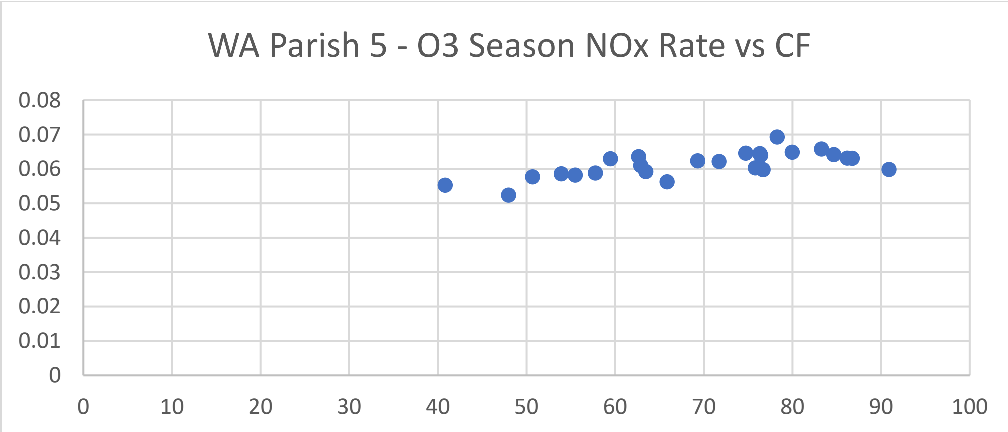


WA Parish Unit 5: Unit 5 (734 MW) at the WA Parish plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.06 lb/MMBtu. It is not operating its SCR consistently in accordance with the lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Parish	5	734	0.0499	0.0908	0.0692

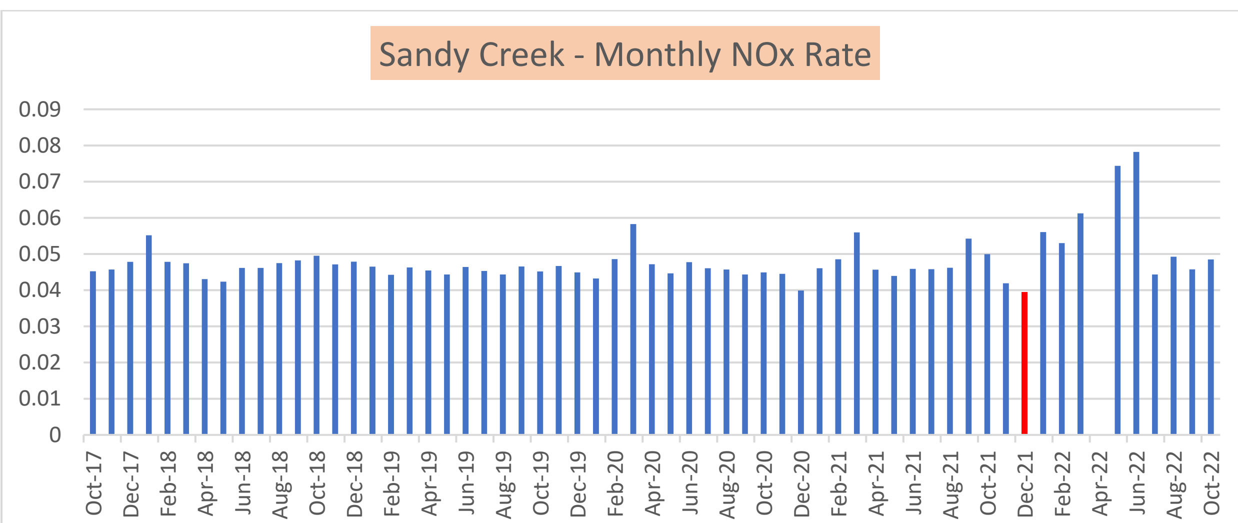


The chart above confirms that WA Parish Unit 5 has achieved levels below 0.06 lb/MMBtu on many months of recent operation, with a low of 0.0499 lb/MMBtu, shown in red. The chart below shows that WA Parish Unit 5 has achieved less than 0.06 lb/MMBtu over a wide range of ozone-season operating capacity factors.

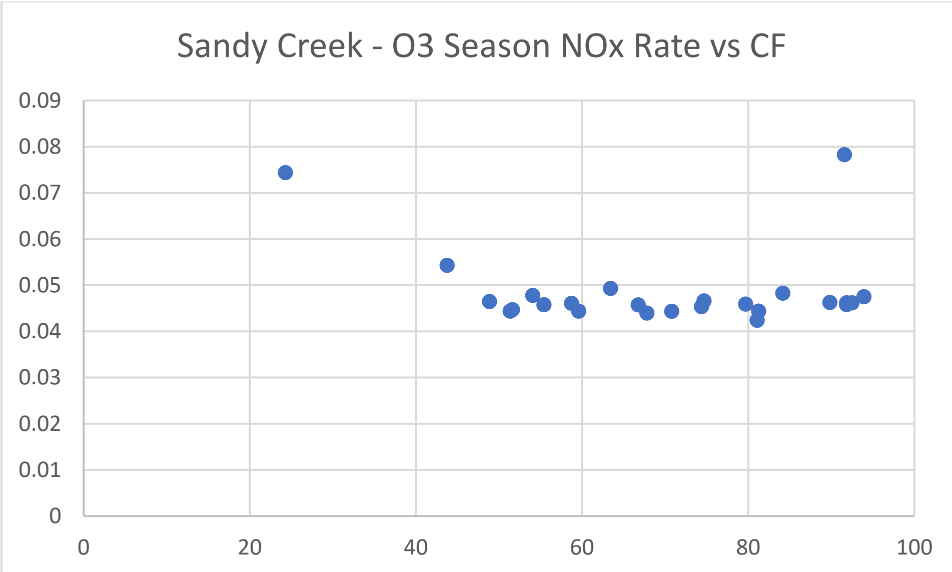


Sandy Creek Unit 1: Sandy Creek Unit 1 (1008 MW) was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Sandy Creek	1	1008	0.0395	0.0782	0.0782



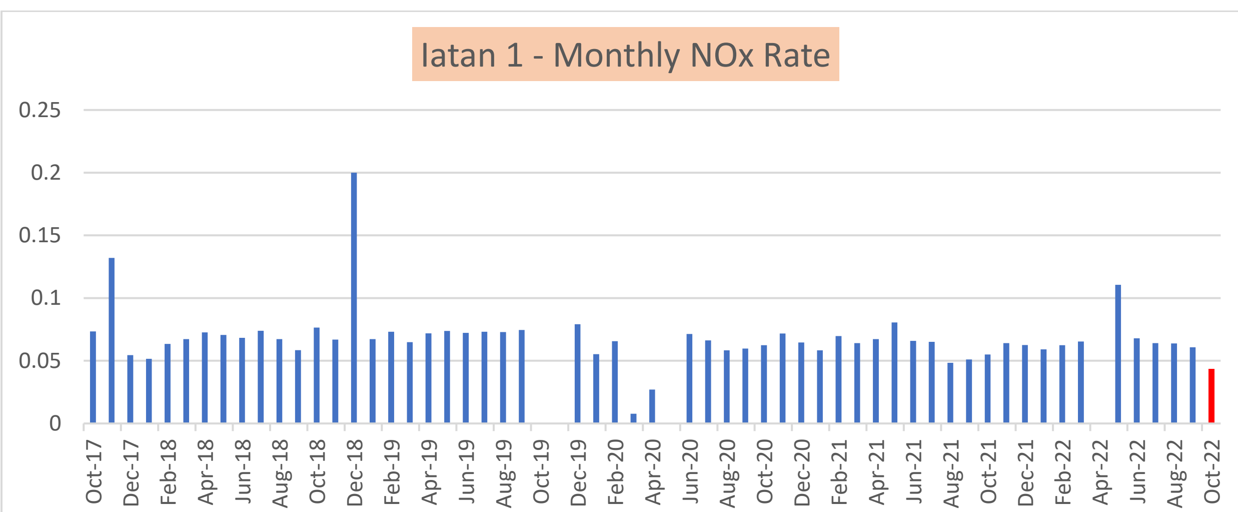
The chart above confirms that Sandy Creek 1 has achieved levels well below 0.05 lb/MMBtu on many months of recent operation, with a low of 0.0395 lb/MMBtu, shown in red. The chart below shows that Sandy Creek 1 has achieved less than 0.05 lb/MMBtu over a wide range of ozone-season operating capacity factors.



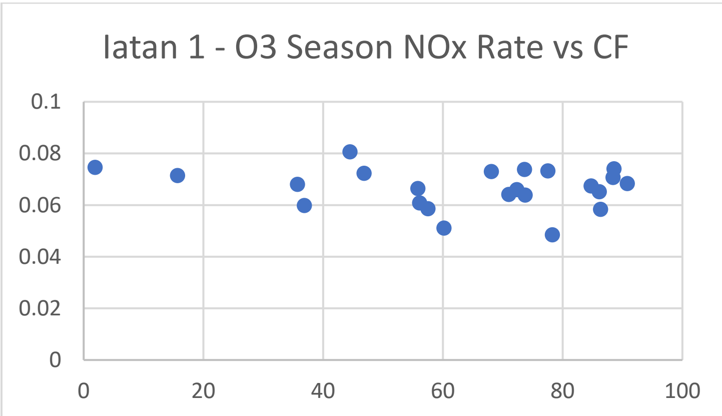
Missouri

Iatan 1: Unit 1 (726 MW) at the Iatan plant was analyzed. This unit has SCR installed. It can achieve reliably lower NOx emission rates below 0.06 lb/MMBtu. It is not operating its SCR consistently in accordance with the SCR's demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Iatan	1	726	0.0435	0.2000	0.0805
Iatan	2	914	0.0454	0.0595	0.0595

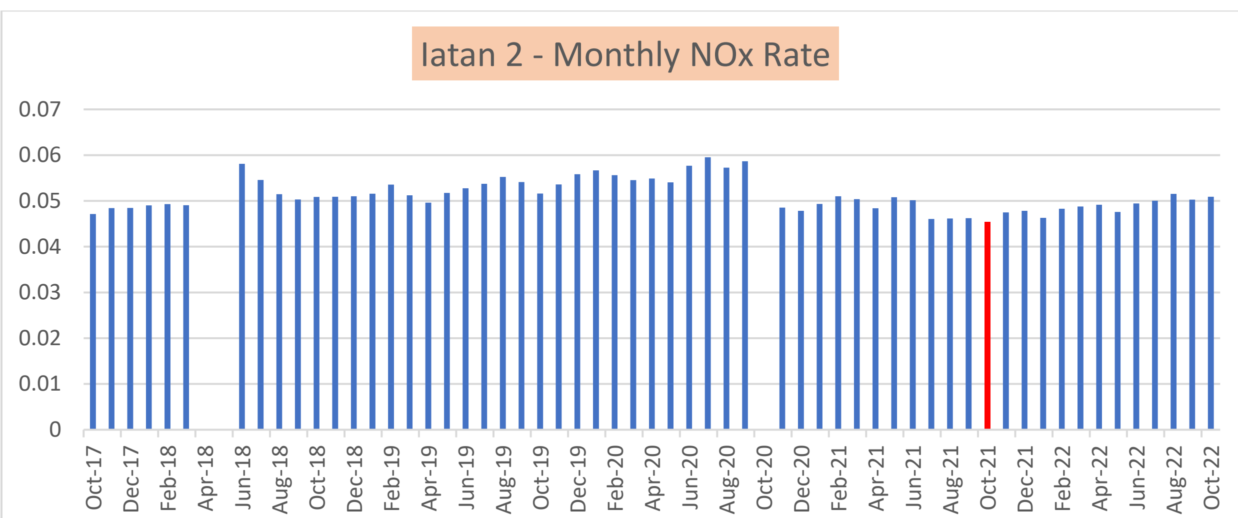


The chart above confirms that Iatan Unit 1 has achieved levels below 0.06 lb/MMBtu on several months of recent operation, with a low of .0435 lb/MMBtu, shown in red. The chart below shows that Iatan Unit 1 has achieved less than 0.06 lb/MMBtu over a wide range of ozone-season operating capacity factors.

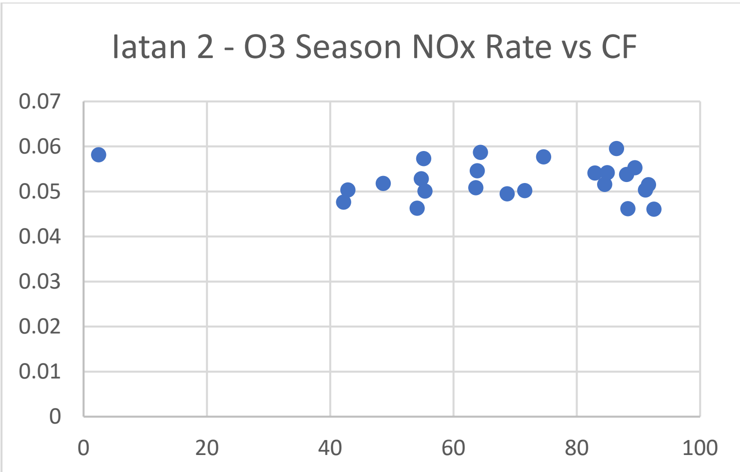


Iatan 2: Unit 2 (914 MW) at the Iatan plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu and has consistently done so from November 2020 through July 2022 excepting two months. It is not operating its SCR consistently in accordance with the SCR's lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Iatan	1	726	0.0435	0.2000	0.0805
Iatan	2	914	0.0454	0.0595	0.0595

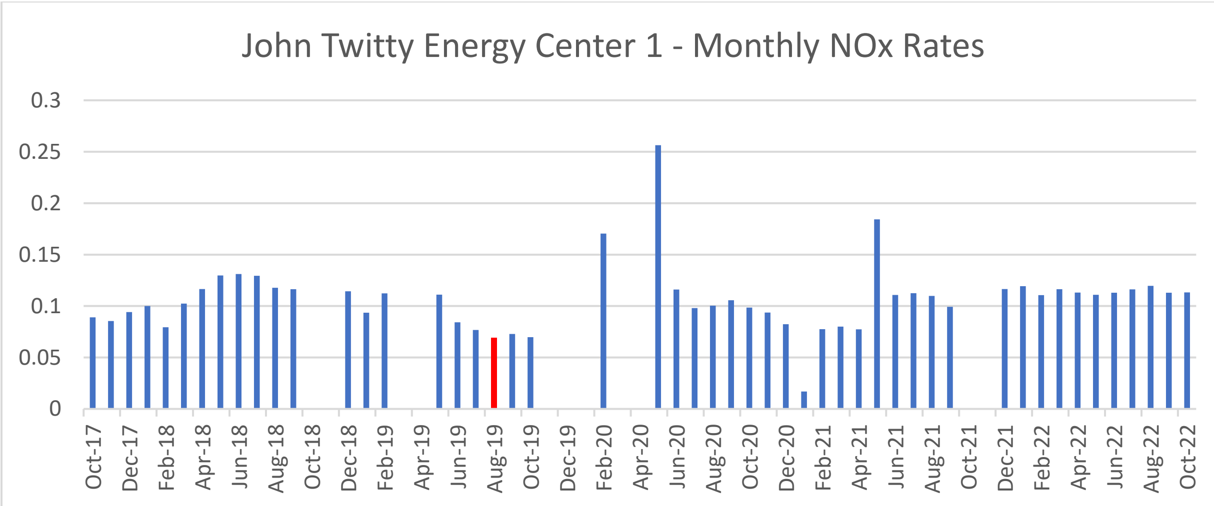


The chart above confirms that Iatan Unit 2 has achieved levels below 0.05 lb/MMBtu on many months of recent operation, with a low of 0.0454 lb/MMBtu, shown in red. The chart below shows that Iatan Unit 2 has achieved less than 0.05 lb/MMBtu over a wide range of ozone-season operating capacity factors.

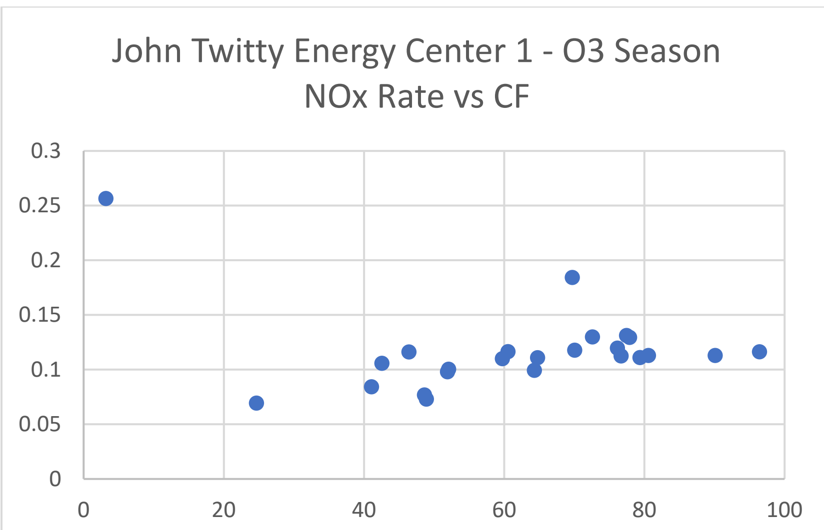


JTEC 1: Unit 1 (194 MW) at the John Twitty Energy Center plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emission rates below 0.08 lb/MMBtu as demonstrated by its operation in 2019. It has wildly variable monthly NOx emission rates, ranging from above 0.25 lb/MMBtu at a high to 0.069 lb/MMBtu at a low. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. Indeed, it reliably emitted above 0.1 lb/MMBtu in late 2021 and 2022, significantly above its lowest demonstrated NOx reduction capacity achieved in 2019 of below 0.08 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
John Twitty Energy Center	1	194	0.0693	0.2564	
John Twitty Energy Center	2	300	0.0637	0.0899	

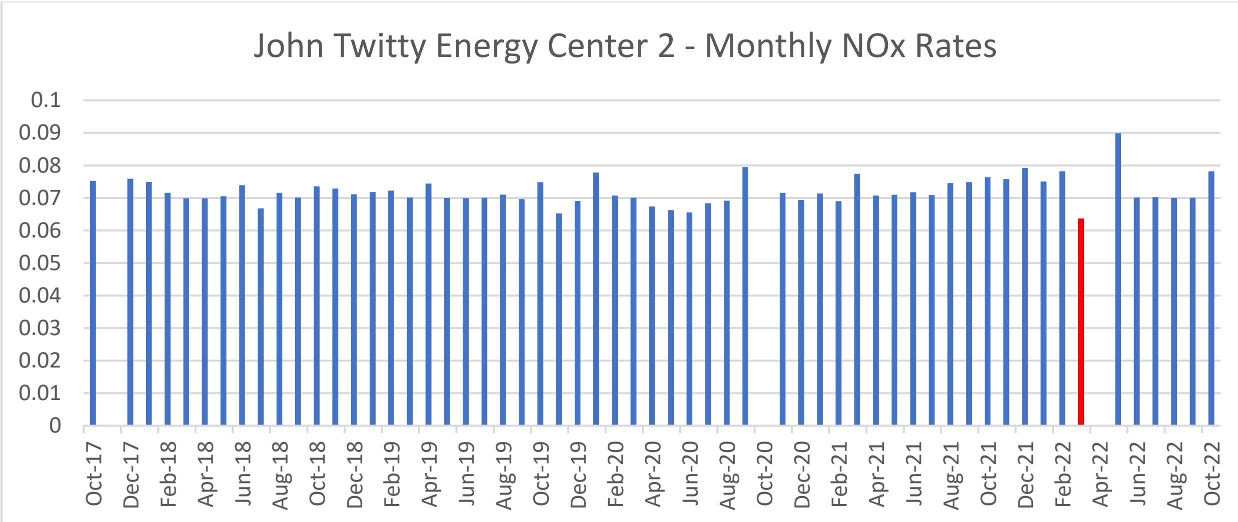


The chart above confirms that John Twitty Energy Center Unit 1 has consistently achieved levels below 0.08 lb/MMBtu on several months of recent operation, with a low of .0693 lb/MMBtu, shown in red. The chart below shows that John Twitty Energy Center Unit 1 has achieved less than 0.08 lb/MMBtu over a range of ozone-season operating capacity factors.

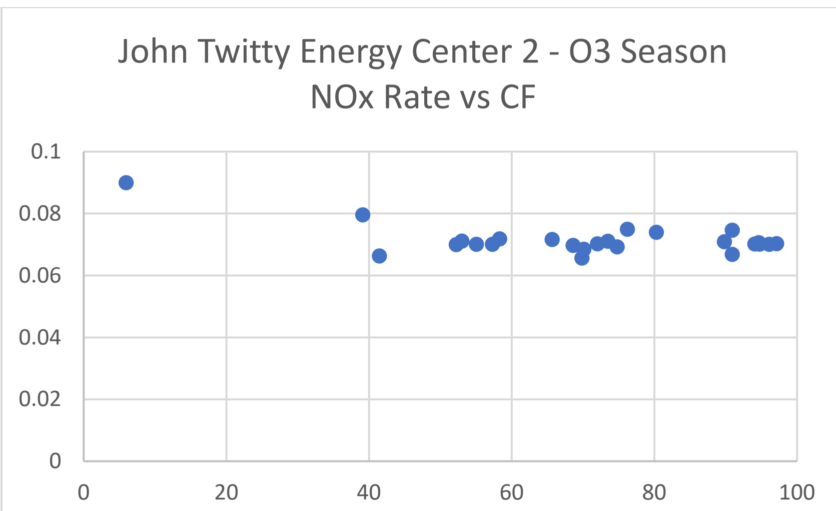


JTEC 2: Unit 2 (300 MW) at the John Twitty Energy Center plant was analyzed. This unit has SCR installed. It can reliably achieve NOx emissions rates at or below 0.07 lb/MMBtu. It is not operating consistent with its lowest demonstrated NOx reduction capacity.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
John Twitty Energy Center	1	194	0.0693	0.2564	
John Twitty Energy Center	2	300	0.0637	0.0899	

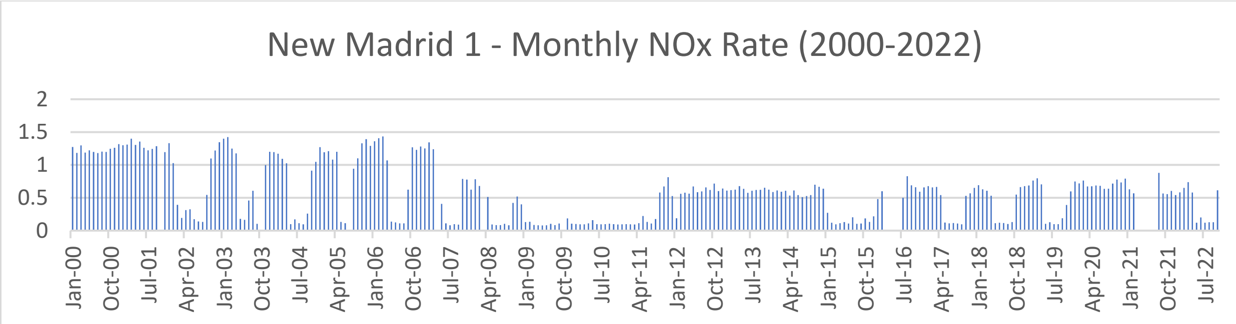


The chart above confirms that John Twitty Energy Center Unit 2 has achieved levels below 0.07 lb/MMBtu on several months of recent operation, with a low of .0637 lb/MMBtu, shown in red. The chart below shows that John Twitty Energy Center Unit 2 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

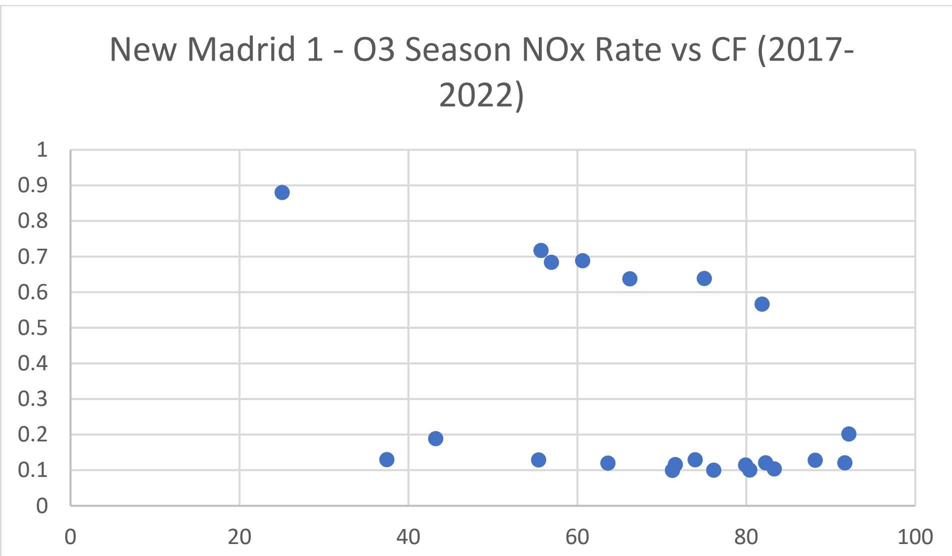


New Madrid 1: Unit 1 (600 MW) at the New Madrid plant was analyzed. This unit has SCR installed. Its NOx emissions rates are wildly variable. The unit can reliably achieve NOx emission rates below 0.10 lb/MMBtu. It is clearly not operating its SCR according to the SCR's NOx reduction capacity. During some ozone seasons, it is emitting at 0.87 lb/MMBtu, over 800% of its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below demonstrate.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
New Madrid	1	600	0.0991	0.08	0.8797	0.8797
New Madrid	2	600	0.1007	0.0764	1.0742	0.6420

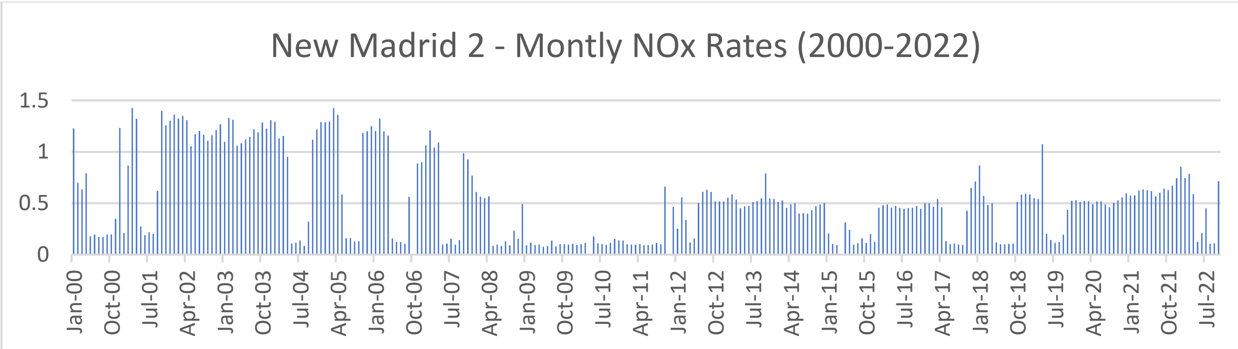


The chart above confirms that New Madrid 1 has reliably achieved levels below 0.10 lb/MMBtu, with a low of .0991 lb/MMBtu. The chart below shows that New Madrid Unit 1 has achieved levels less than approximately 0.10 lb/MMBtu over a range of ozone-season operating capacity factors.

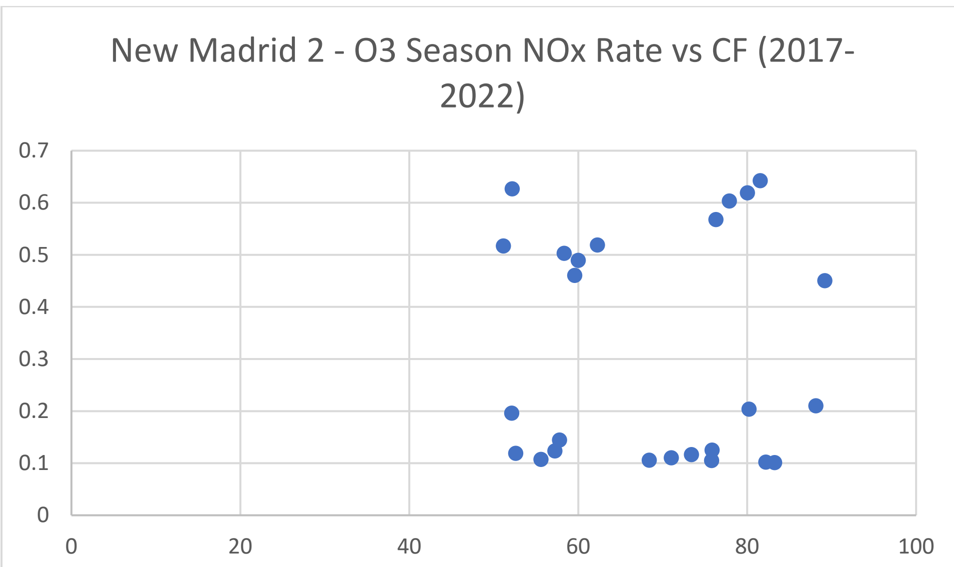


New Madrid 2: Unit 2 (600 MW) at the New Madrid plant was analyzed. Its NOx emissions rates are wildly variable. The unit can reliably achieve NOx emission rates below approximately 0.10 lb/MMBtu. It is clearly not operating its SCR according to the SCR's NOx reduction capacity. During some ozone seasons, it is emitting at 0.64 lb/MMBtu, over 600% of its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below demonstrate.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
New Madrid	1	600	0.0991	0.08	0.8797	0.8797
New Madrid	2	600	0.1007	0.0764	1.0742	0.6420

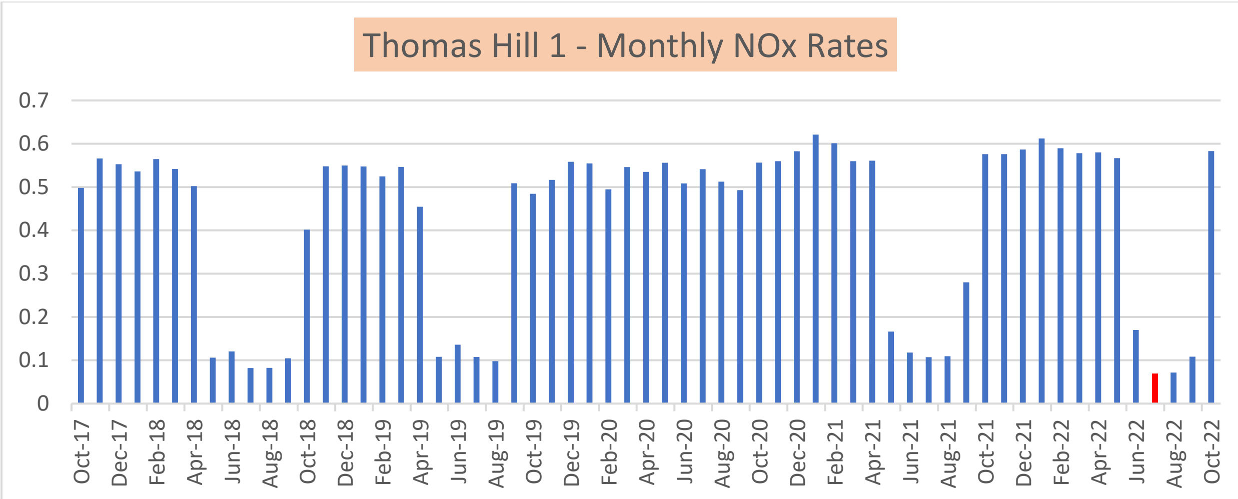


The chart above confirms that New Madrid 2 has reliably achieved levels of approximately 0.10 lb/MMBtu, with a low of .1007 lb/MMBtu. The chart below shows that New Madrid Unit 2 has achieved levels of approximately 0.10 lb/MMBtu over a range of ozone-season operating capacity factors.

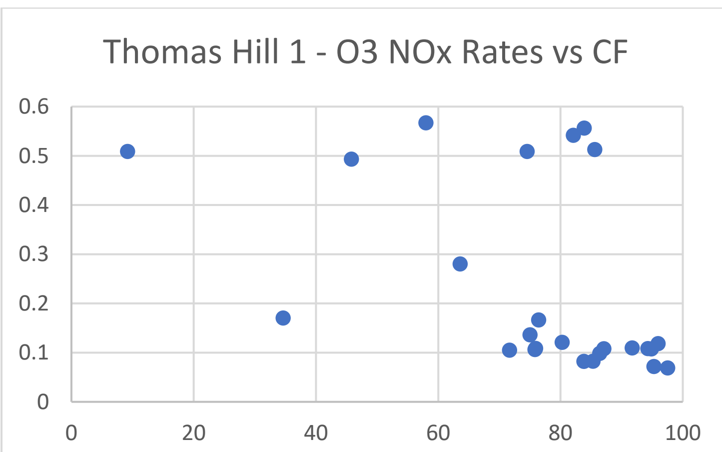


TH 1: Unit 1 (180 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

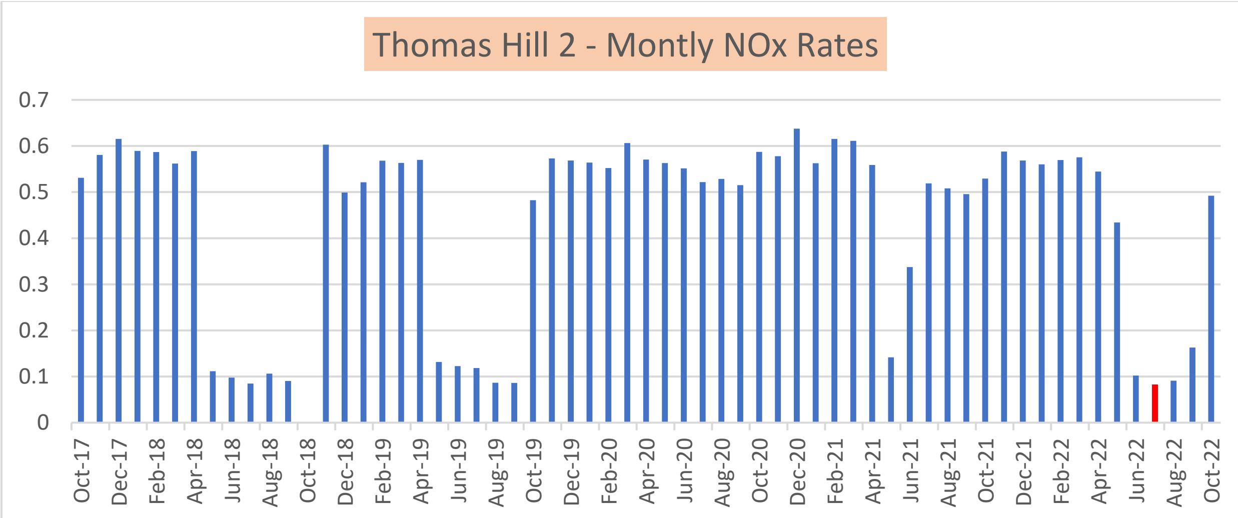


The chart above confirms that Thomas Hill 1 has reliably achieved levels below 0.10 lb/MMBtu, with a low of .0686 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 1 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

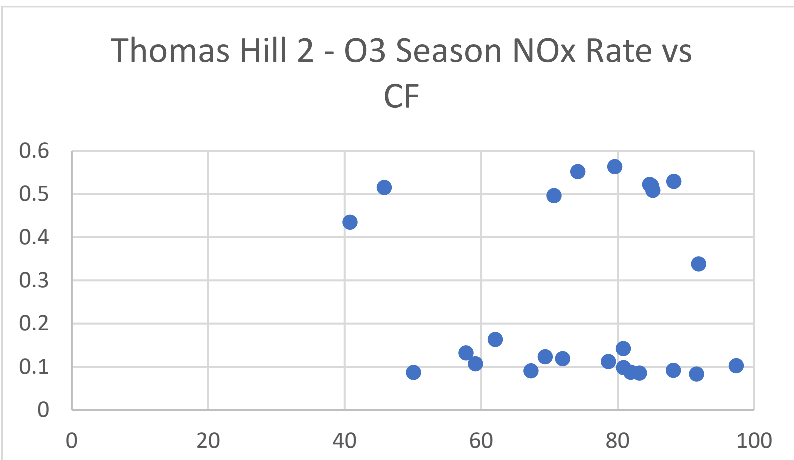


TH 2: Unit 2 (285 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

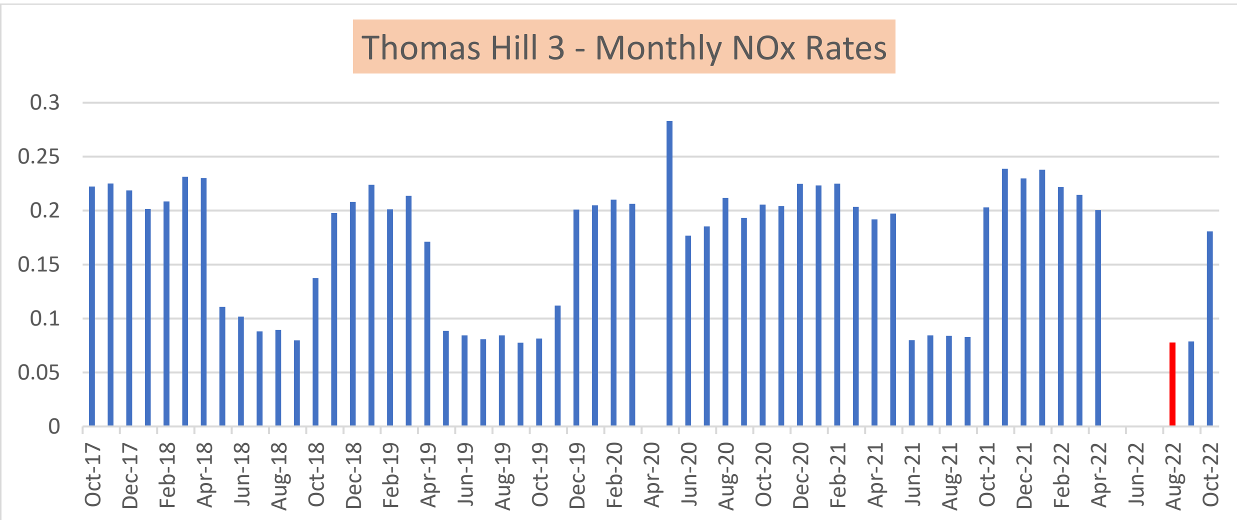


The chart above confirms that Thomas Hill 2 has achieved levels below 0.10 lb/MMBtu, with a low of .0825 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 2 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

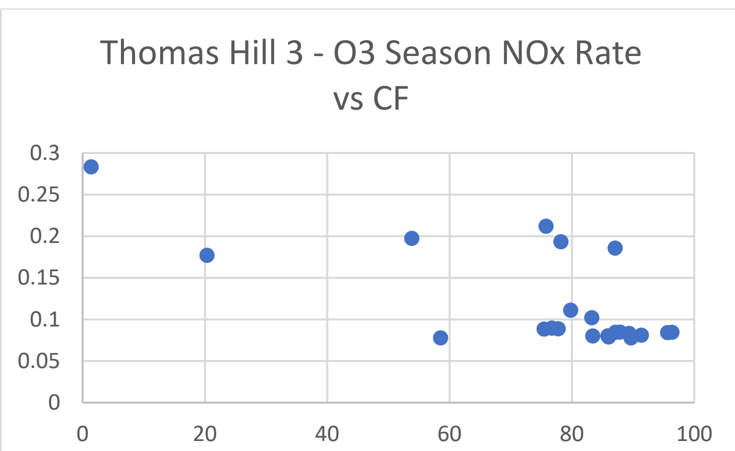


TH 3: Unit 3 (670 MW) at the Thomas Hill plant was analyzed. It has SCR installed. It can clearly achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity. It is not because of low capacity factor nor MOT issues as the charts below make clear. Indeed, its operation of its SCR is wildly erratic, including between ozone seasons.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Thomas Hill	1	180	0.0686	0.6209	0.5668
Thomas Hill	2	285	0.0825	0.6374	0.5628
Thomas Hill	3	670	0.0775	0.2832	0.2832

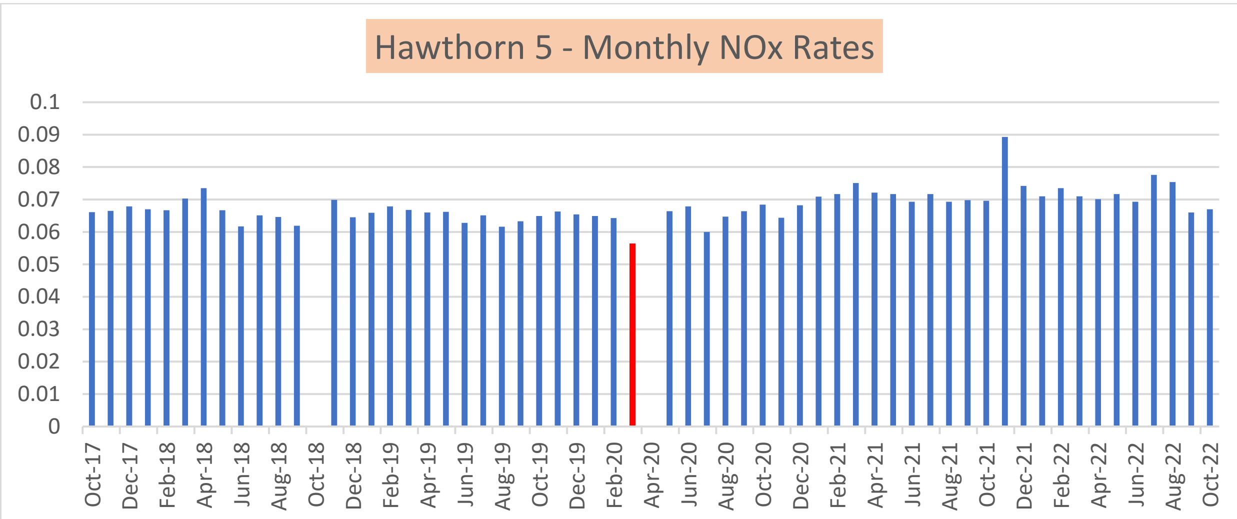


The chart above confirms that Thomas Hill 3 has achieved levels below 0.10 lb/MMBtu, with a low of .0775 lb/MMBtu, shown in red. The chart below shows that Thomas Hill 3 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

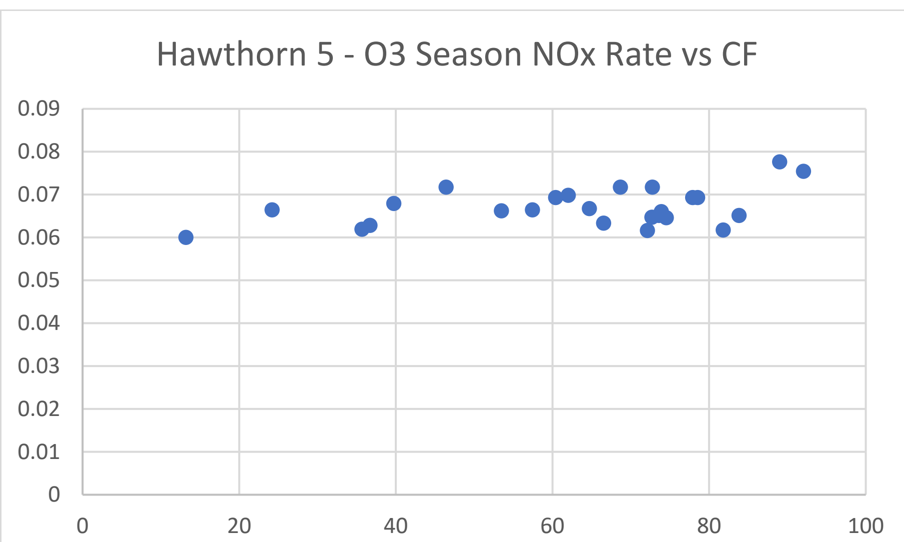


Hawthorn 5: Unit 5 (594 MW) at the Hawthorn plant was analyzed. It has SCR installed. The unit can reliably achieve NOx emissions rates of below 0.07 lb/MMBtu. It is not operating its SCR consistent with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Hawthorn	5	594	0.0563	0.0893	0.0776



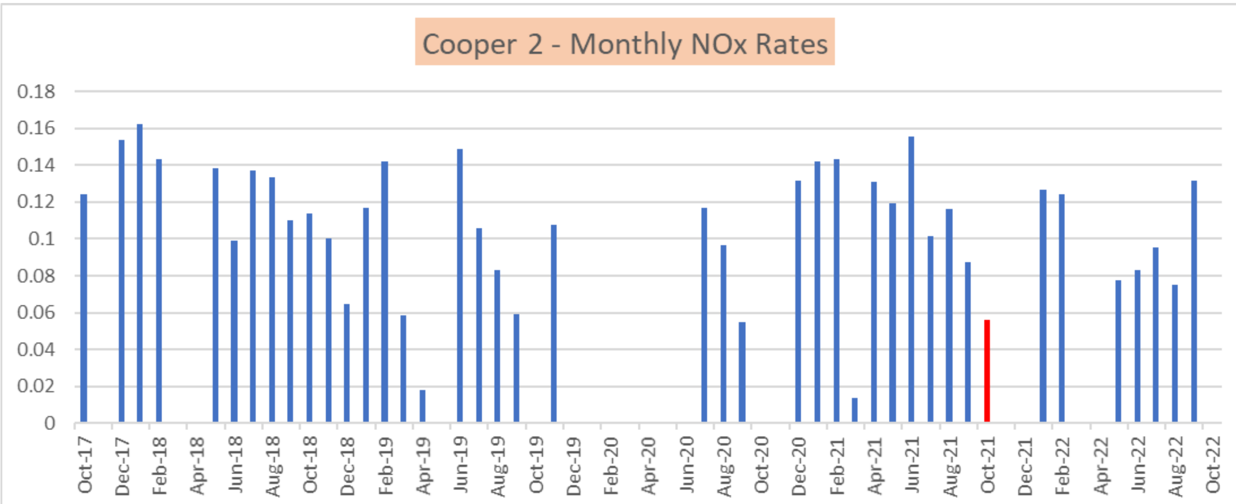
The chart above confirms that Hawthorn Unit 5 has achieved levels below 0.07 lb/MMBtu on many months of recent operation, with a low of 0.0563 lb/MMBtu, shown in red. The chart below shows that Hawthorn Unit 5 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.



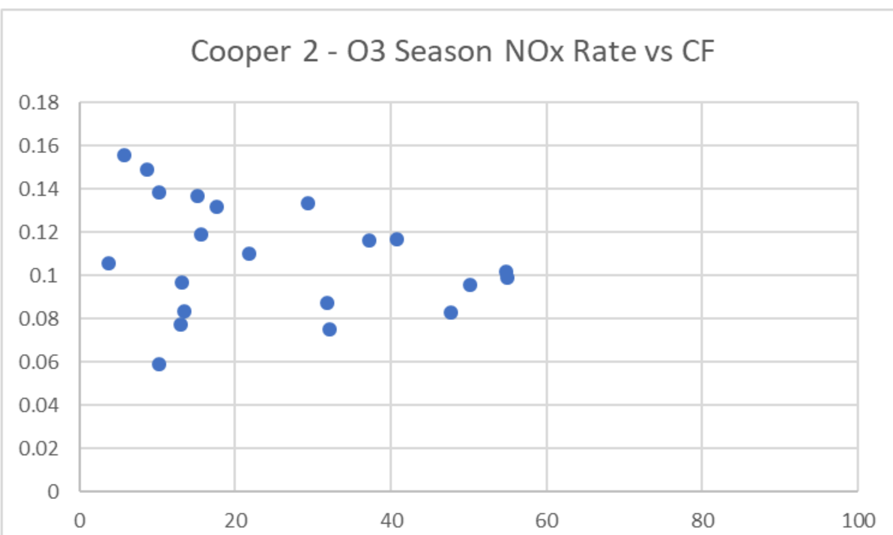
Kentucky

Cooper 2: Unit 2 (230 MW) at the Cooper plant was analyzed. It has SCR installed. It can achieve reliably lower NOx emission rates. The unit can reliably achieve NOx emissions rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently according to the SCR's lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Cooper	2	230	0.0563	0.1625	0.1554

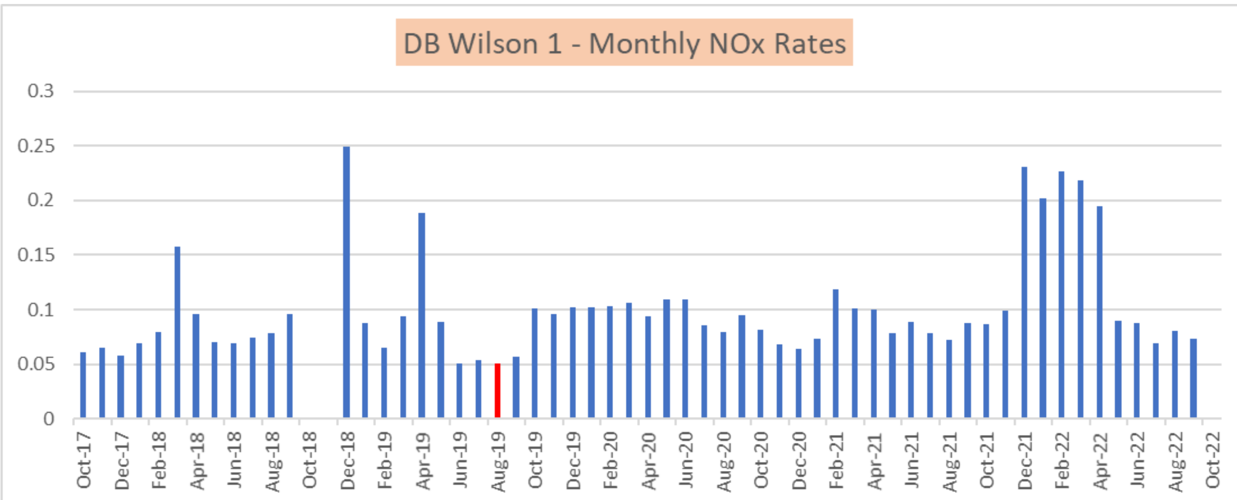


The chart above confirms that Cooper Unit 2 has achieved levels below 0.10 lb/MMBtu on many months of recent operation, with a low of 0.0563 lb/MMBtu, shown in red.

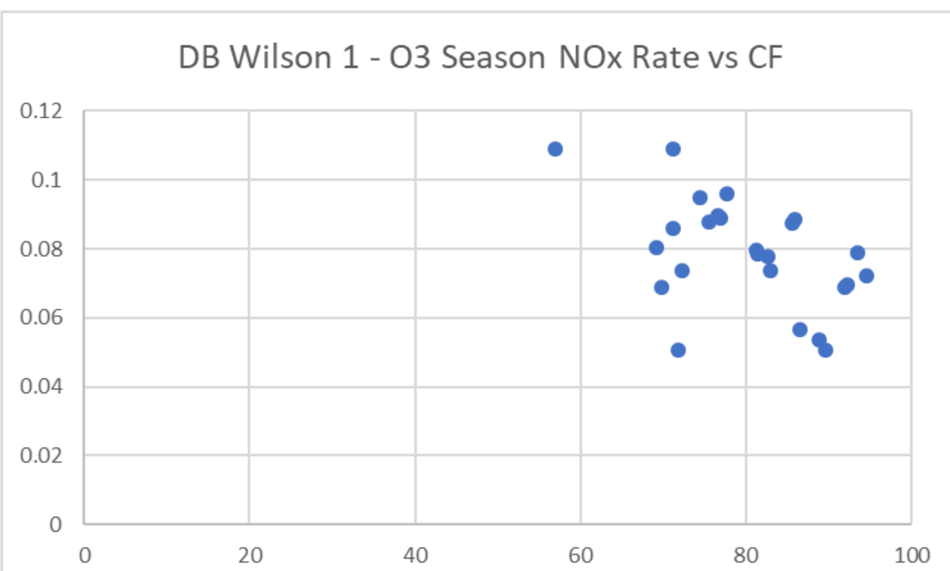


DB Wilson 1: Unit 1 (566 MW) at the DB Wilson plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of below 0.07 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
DB Wilson	1	566	0.0505	0.2491	0.1091

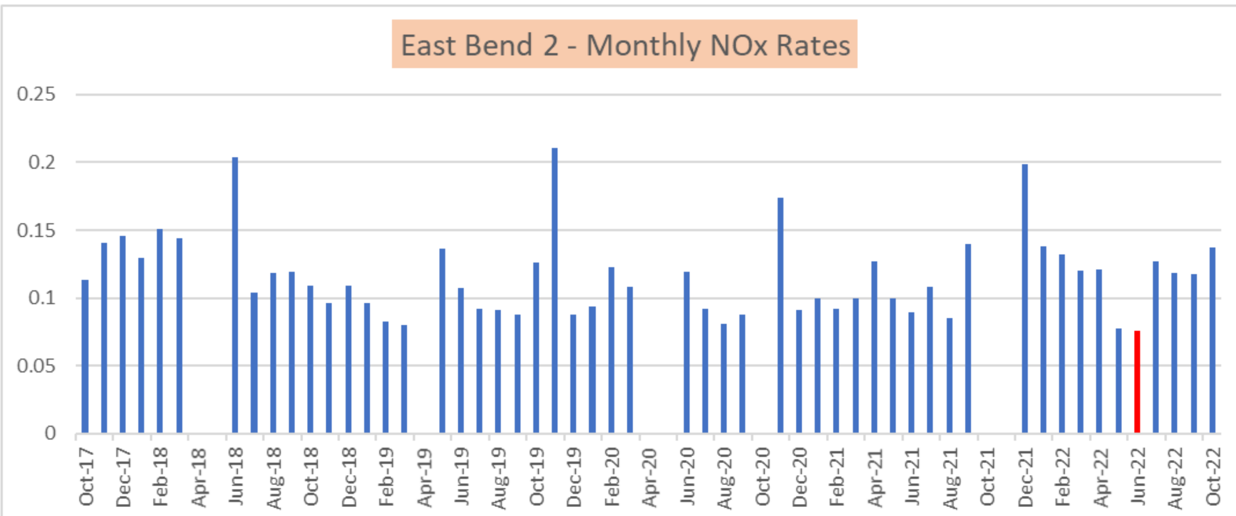


The chart above confirms that DB Wilson Unit 1 can reliably achieve levels below 0.07 lb/MMBtu on several months of operation, with a low of 0.0505 lb/MMBtu, shown in red. The chart below shows that DB Wilson Unit 1 has achieved less than 0.07 lb/MMBtu over a range of ozone-season operating capacity factors.

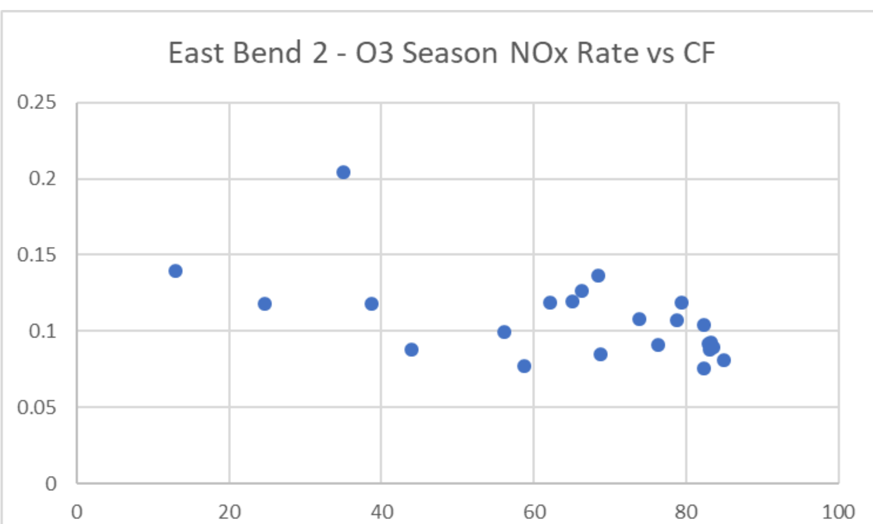


East Bend 2: Unit 2 (669 MW) at the East Bend plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.10 lb/MMBtu and below. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
East Bend	2	669	0.0758	0.2110	0.2041

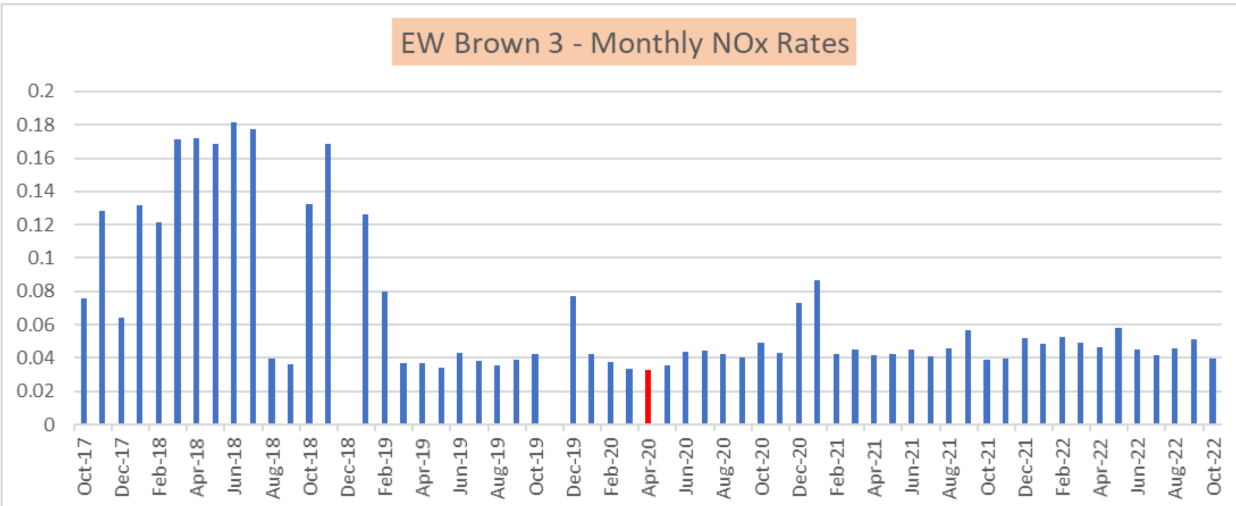


The chart above confirms that East Bend Unit 2 has regularly achieved levels of below 0.10 lb/MMBtu, with a low of 0.0758 lb/MMBtu, shown in red. The chart below shows that East Bend 2 has achieved less than 0.10 lb/MMBtu over a wide range of ozone-season operating capacity factors.

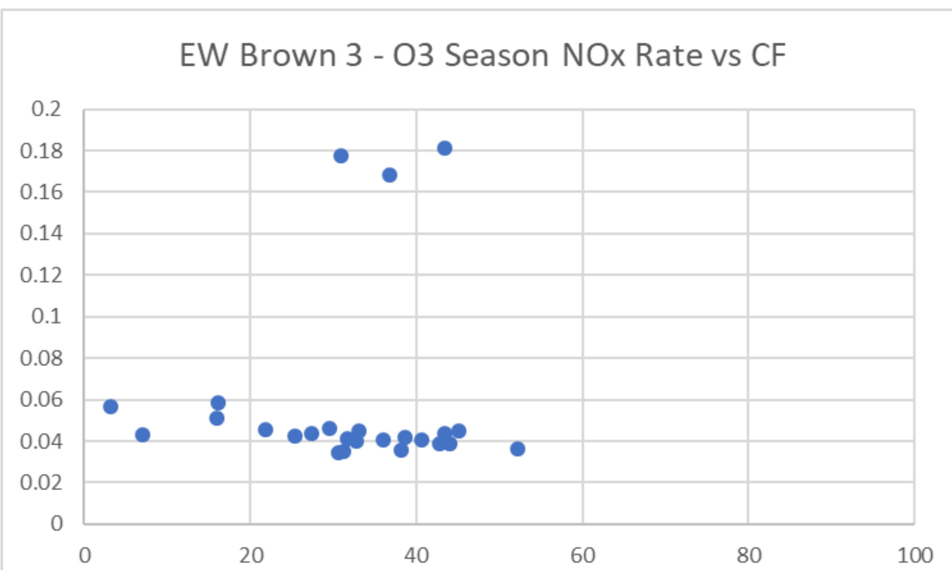


EW Brown 3: Unit 3 (464 MW) at the EW Brown plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of approximately 0.04 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
EW Brown	3	464	0.0326	0.1813	0.1813

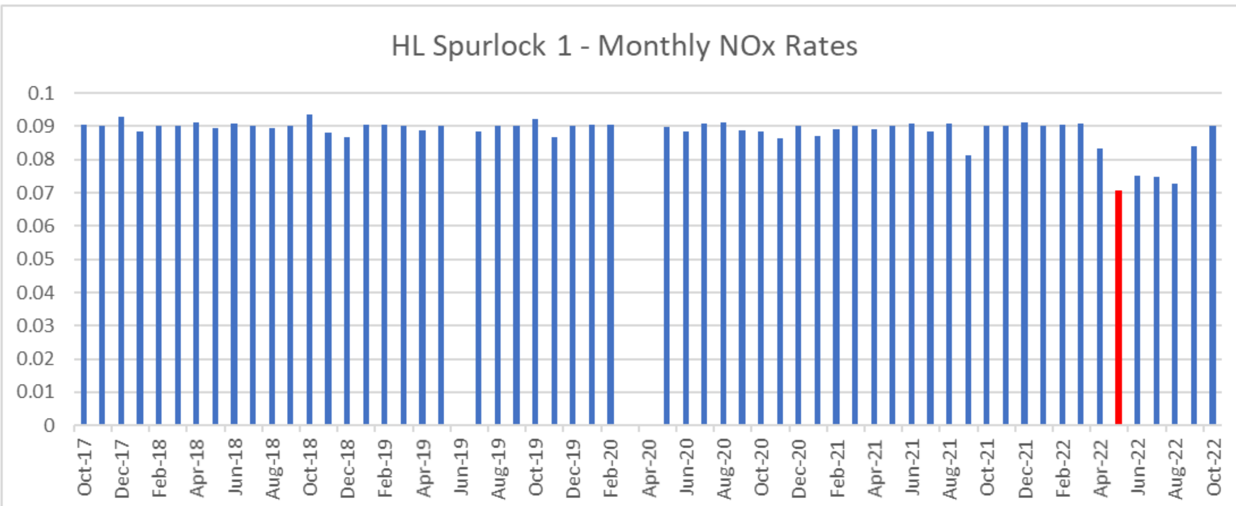


The chart above confirms that EW Brown Unit 3 has regularly achieved levels of approximately 0.04 lb/MMBtu, with a low of 0.0326 lb/MMBtu, shown in red. The chart below shows that EW Brown Unit 3 has achieved less than 0.04 lb/MMBtu over a wide range of ozone-season operating capacity factors.

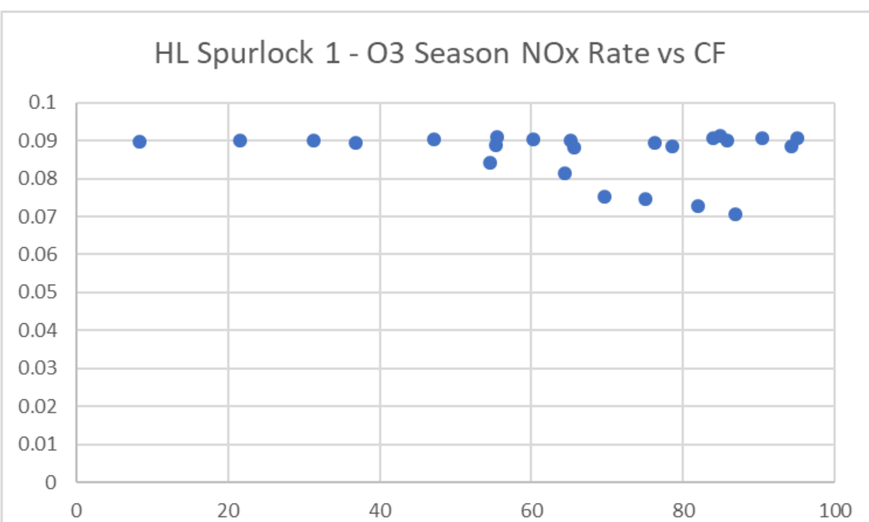


HL Spurlock 1: Unit 1 (385 MW) at the HL Spurlock plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.09 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
HL Spurlock	1	358	0.0707	0.0936	0.0912
HL Spurlock	2	592	0.0604	0.1290	0.0921

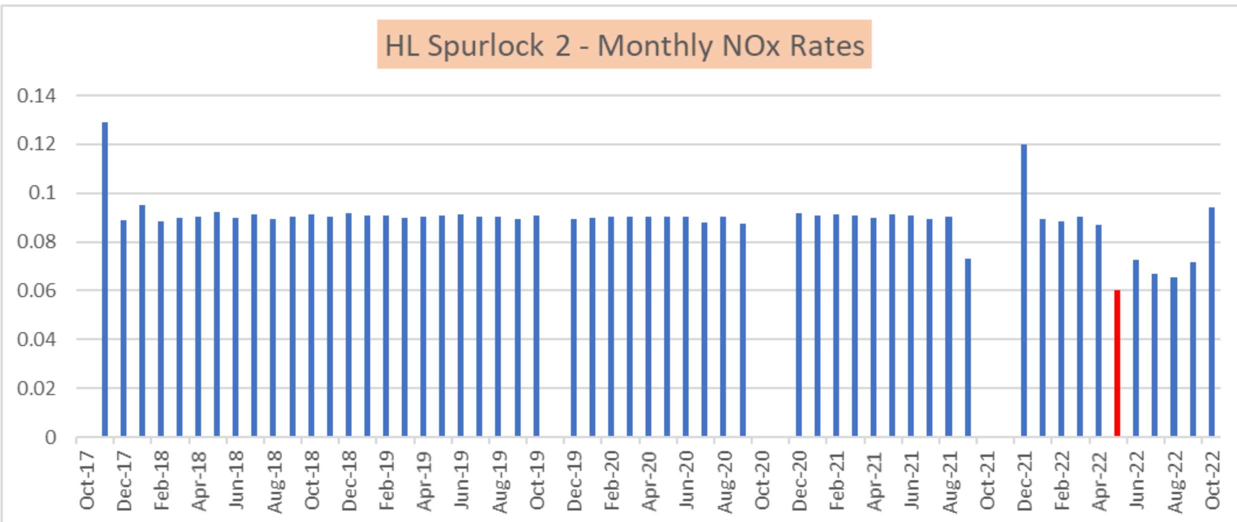


The chart above confirms that Spurlock Unit 1 reliably achieves NOx emissions of below 0.09 lb/MMBtu, and has maintained NOx emissions of below 0.08 lb/MMBtu during the 2022 ozone season, with a low of 0.0707 lb/MMBtu, shown in red. The chart below shows that Spurlock 1 has achieved less than 0.09 lb/MMBtu and below over a wide range of ozone-season operating capacity factors.

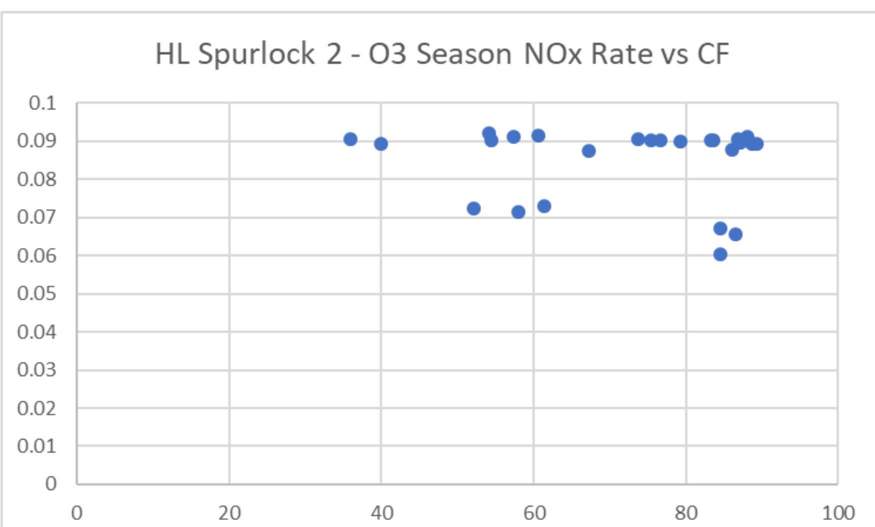


HL Spurlock 2: Unit 2 (592 MW) at the Spurlock 2 plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.09 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
HL Spurlock	1	358	0.0707	0.0936	0.0912
HL Spurlock	2	592	0.0604	0.1290	0.0921

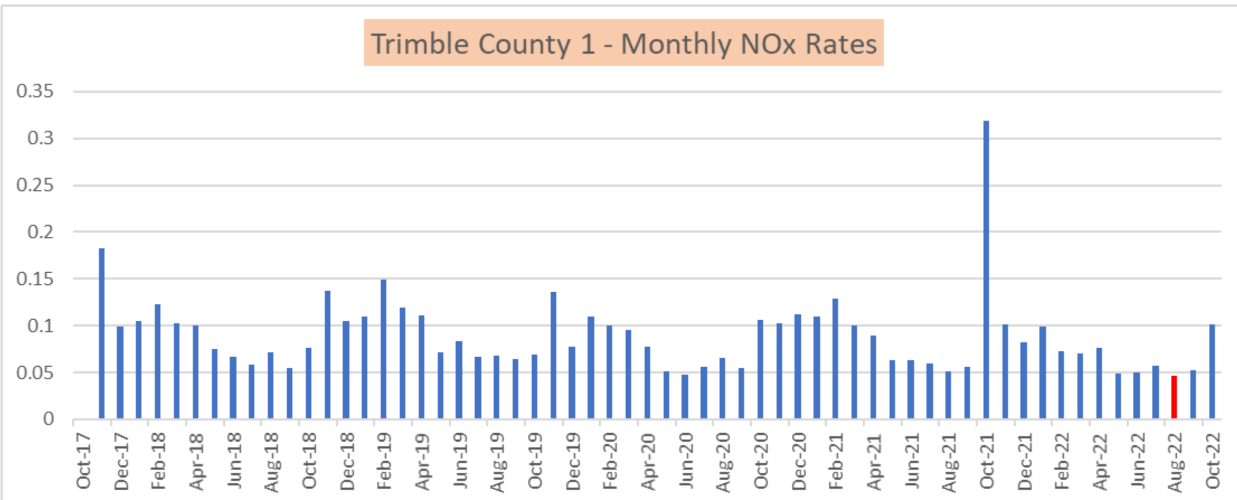


The chart above confirms that Spurlock Unit 2 reliably achieves NOx emissions of below 0.09 lb/MMBtu, and has maintained NOx emissions of below 0.08 lb/MMBtu during the 2022 ozone season, with a low of 0.0604 lb/MMBtu, shown in red. The chart below shows that Spurlock 2 has achieved less than 0.09 lb/MMBtu and below over a range of ozone-season operating capacity factors.

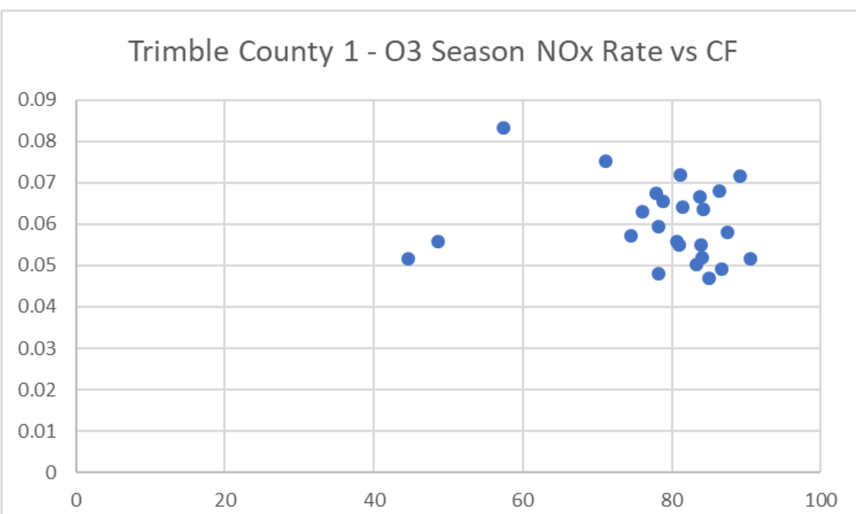


TC 1: Unit 1 (566 MW) at the Trimble County plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of 0.07 lb/MMBtu and below, regularly achieving approximately 0.05 lb/MMBtu during ozone seasons 2022, 2021, and 2020. It is clearly not operating its SCR according to the SCR's NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Trimble County	1	566	0.0470	0.3192	0.0832
Trimble County	2	834	0.0257	0.3788	0.0757

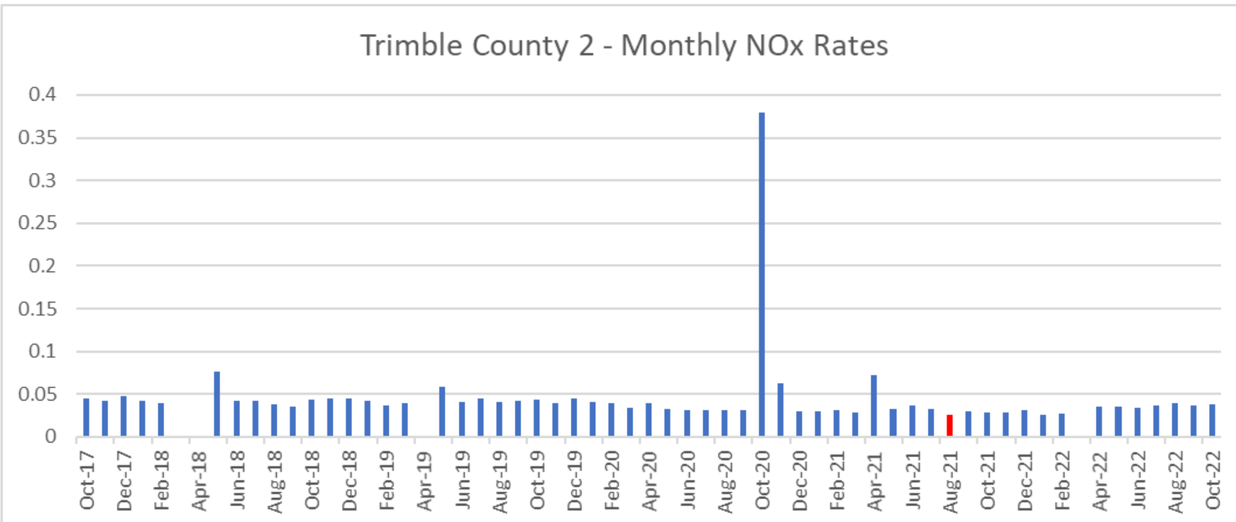


The chart above confirms that Trimble County 1 has achieved levels below 0.05 lb/MMBtu, with a low of .0470 lb/MMBtu, shown in red. The chart below shows that Trimble County 1 has achieved less than 0.05 lb/MMBtu over a range of ozone-season operating capacity factors.

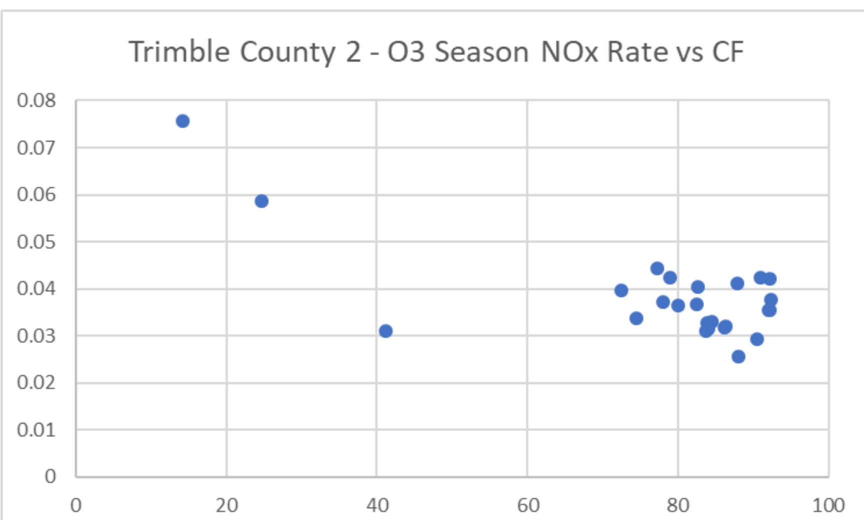


TC 2: Unit 2 (834 MW) at the Trimble County plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates below 0.05 lb/MMBtu.

Plant	Unit	MW	NOx, Min	NOx, Max	NOx, Max 03 Months
Trimble County	1	566	0.0470	0.3192	0.0832
Trimble County	2	834	0.0257	0.3788	0.0757

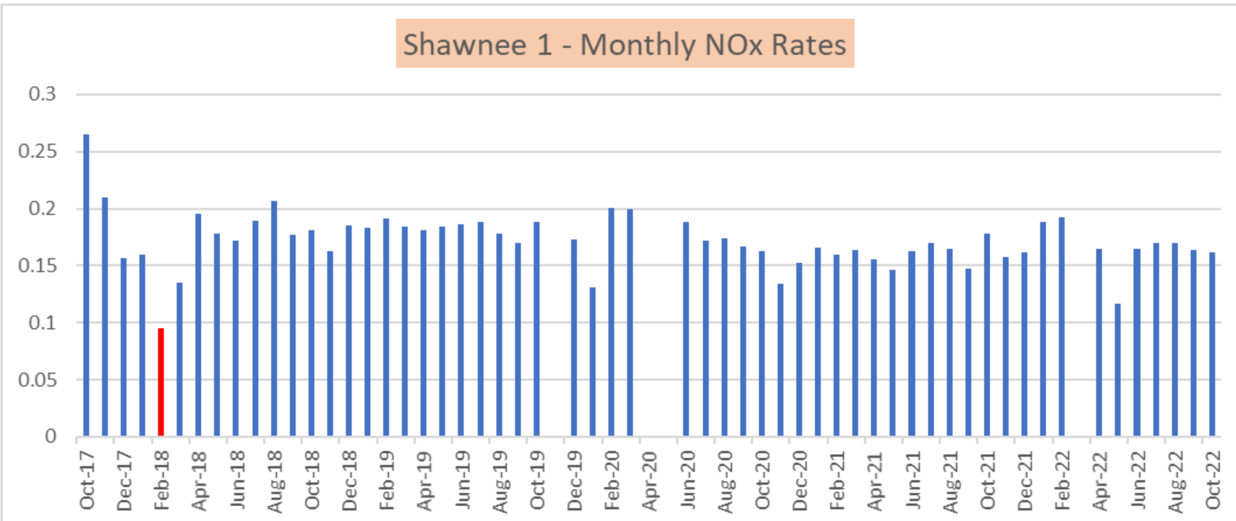


The chart above confirms that Trimble County 2 has often achieved levels well below 0.05 lb/MMBtu, with a low of .0257 lb/MMBtu, shown in red. The chart below shows that Trimble County 2 has achieved less than 0.05 lb/MMBtu over a range of ozone-season operating capacity factors.

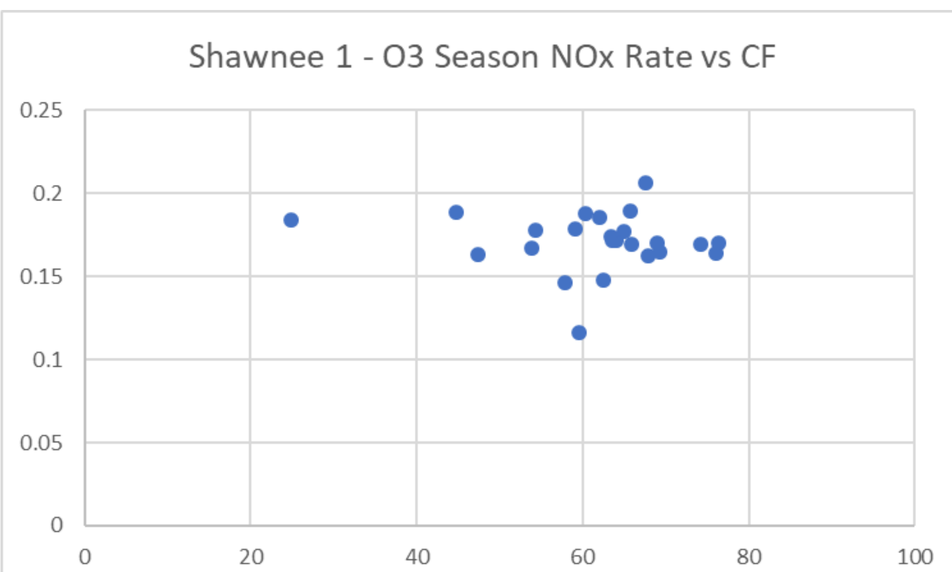


Shawnee 1: Unit 1 (175 MW) at the Shawnee plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Shawnee	1	175	0.0954	N/A	0.2655	0.2063
Shawnee	4	175	0.1045	0.1045	0.2517	0.2057

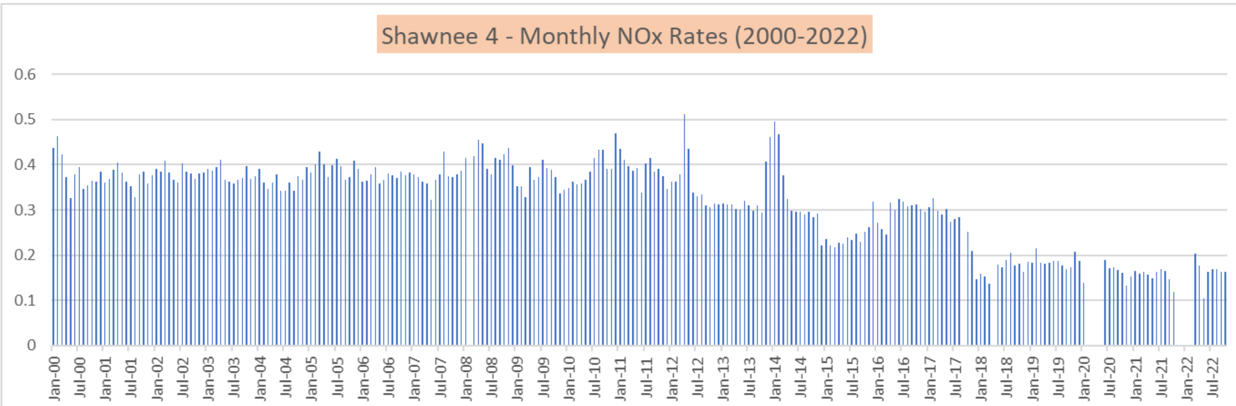


The chart above confirms that Shawnee 1 has consistently exceeded 0.15 lb/MMBtu, and on occasion has been shown to reduce NOx emissions rates to below 0.10 lb/MMBtu, with a low of .0954 lb/MMBtu, shown in red. The chart below shows that Shawnee 1's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

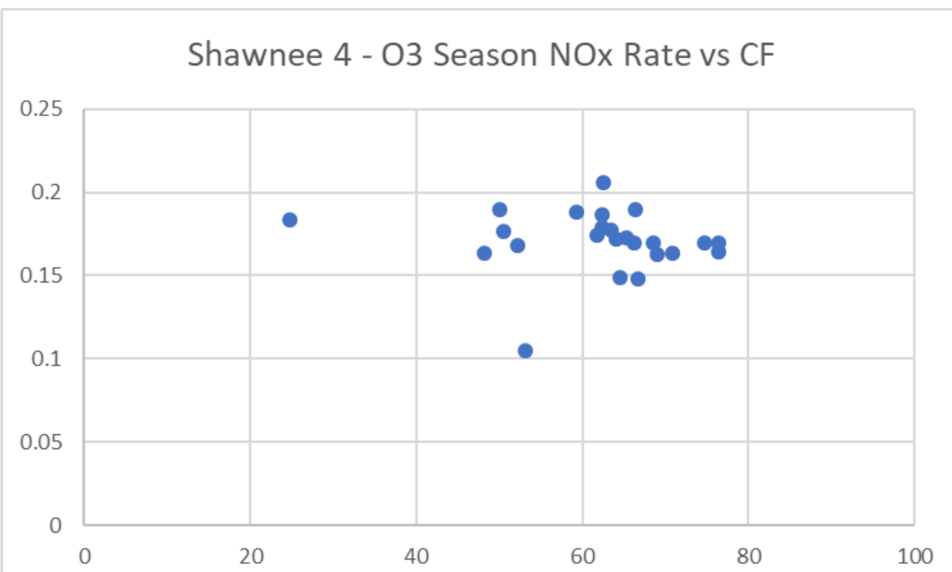


Shawnee 4: Unit 4 (175 MW) at the Shawnee plant. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Shawnee	1	175	0.0954	N/A	0.2655	0.2063
Shawnee	4	175	0.1045	0.1045	0.2517	0.2057

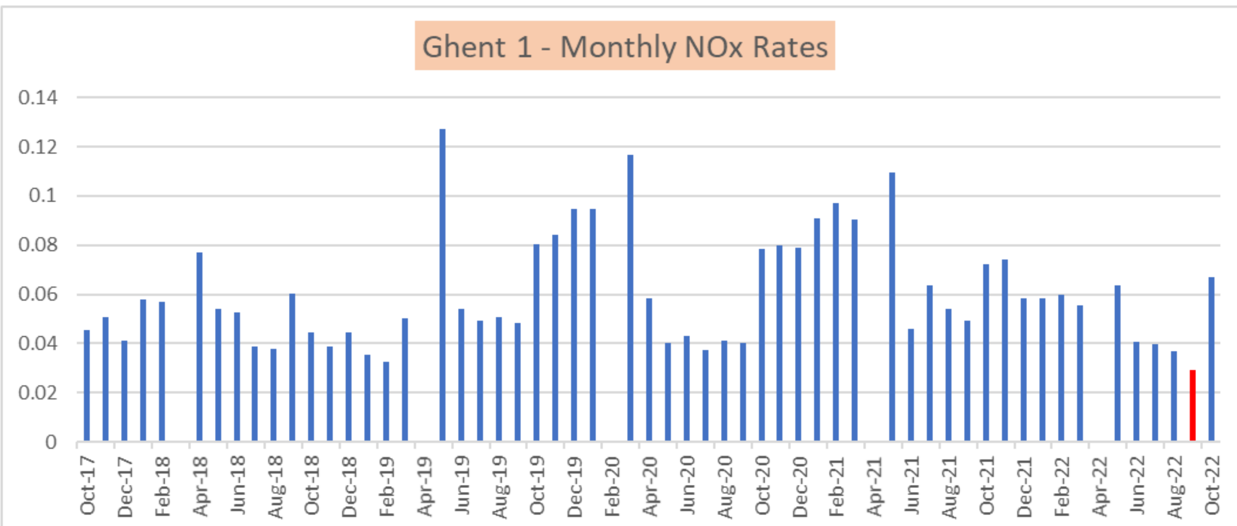


The chart above confirms that Shawnee 4 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .1045 lb/MMBtu, shown in red. The chart below shows that Shawnee 4's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

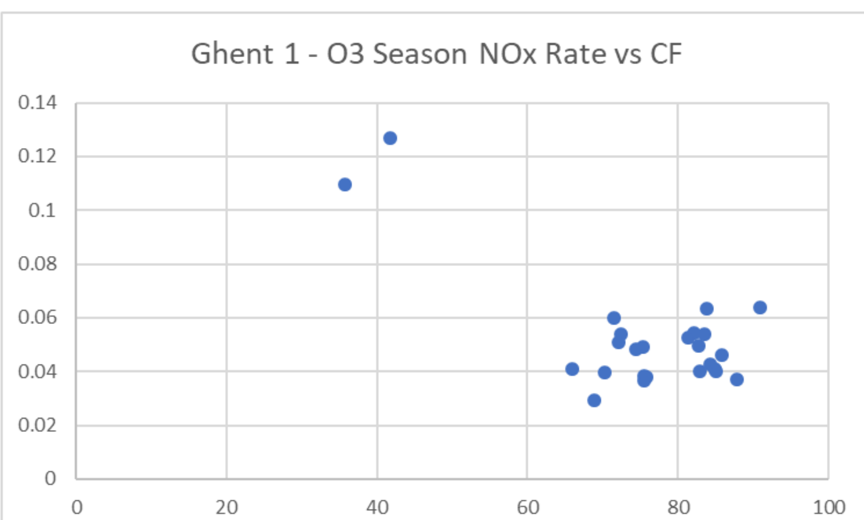


Ghent 1: Unit 1 (557 MW) at the Ghent plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates of below 0.04 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capabilities, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

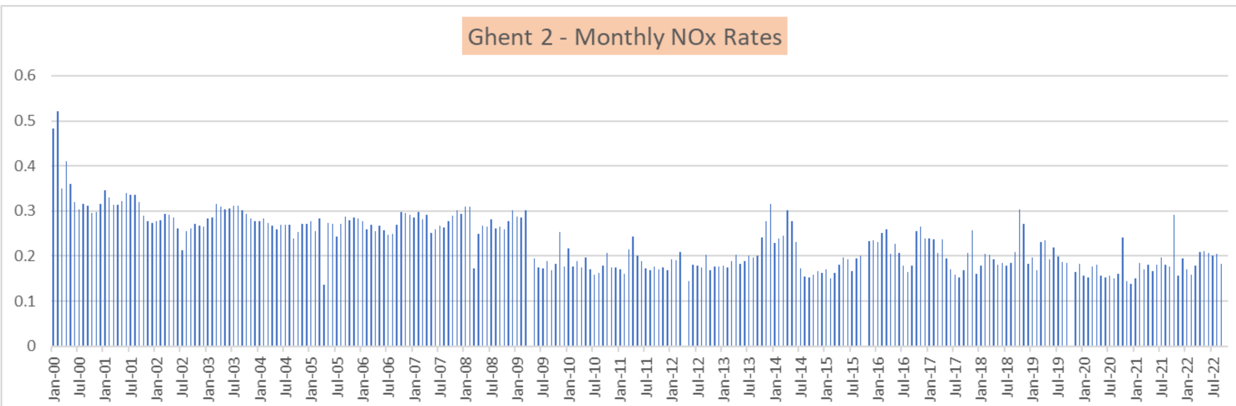


The chart above confirms that Ghent 1 has achieved levels below 0.04 lb/MMBtu, with a low of .0292 lb/MMBtu, shown in red. The chart below shows that Ghent 1 has achieved less than 0.04 lb/MMBtu over a range of ozone-season operating capacity factors.

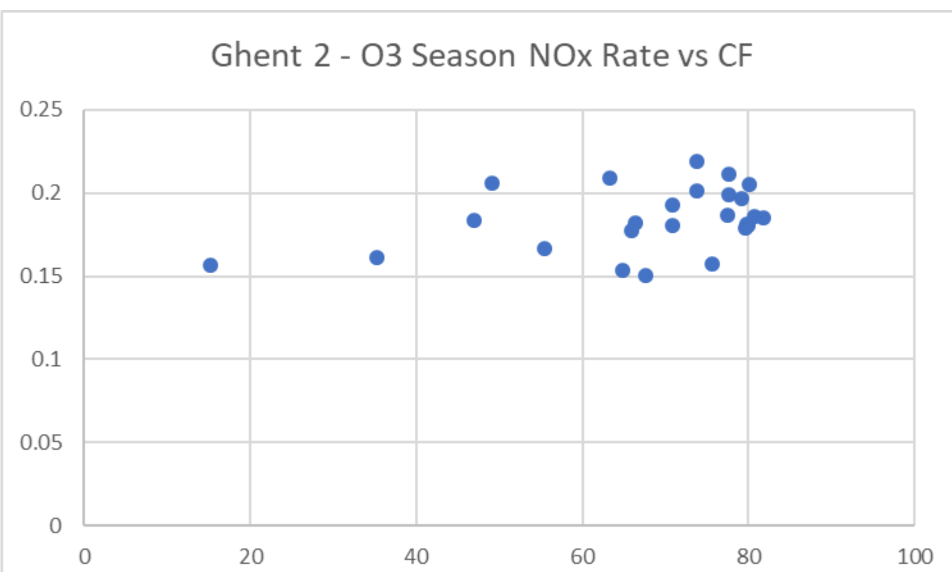


Ghent 2: Unit 2 (556 MW) at the Ghent plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

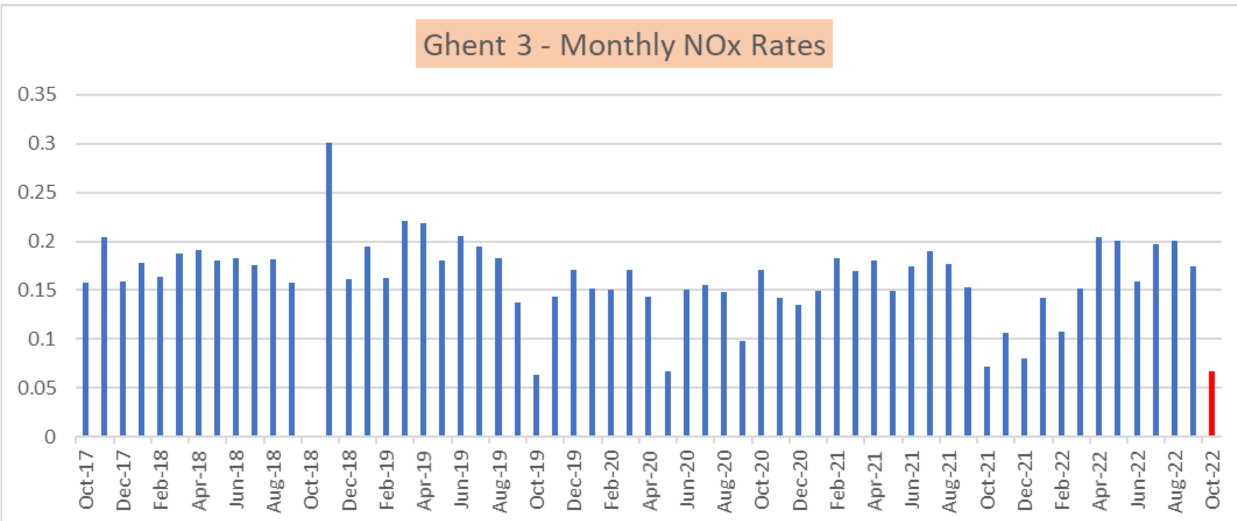


The chart above confirms that Ghent 2 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .1383 lb/MMBtu, shown in red. The chart below shows that Ghent 2's high emission rates are consistent over a wide range of ozone-season operating capacity factors.

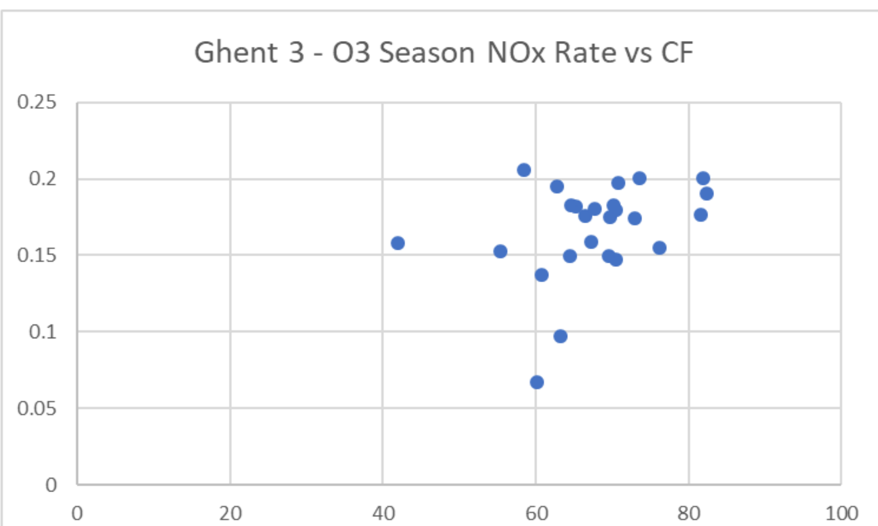


Ghent 3: Unit 3 (557 MW) at the Ghent plant was analyzed. It has SCR installed. Its NOx emissions rates, which are regularly above 0.15 lb/MMBtu, are inconsistent with the capabilities of SCR technology.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842

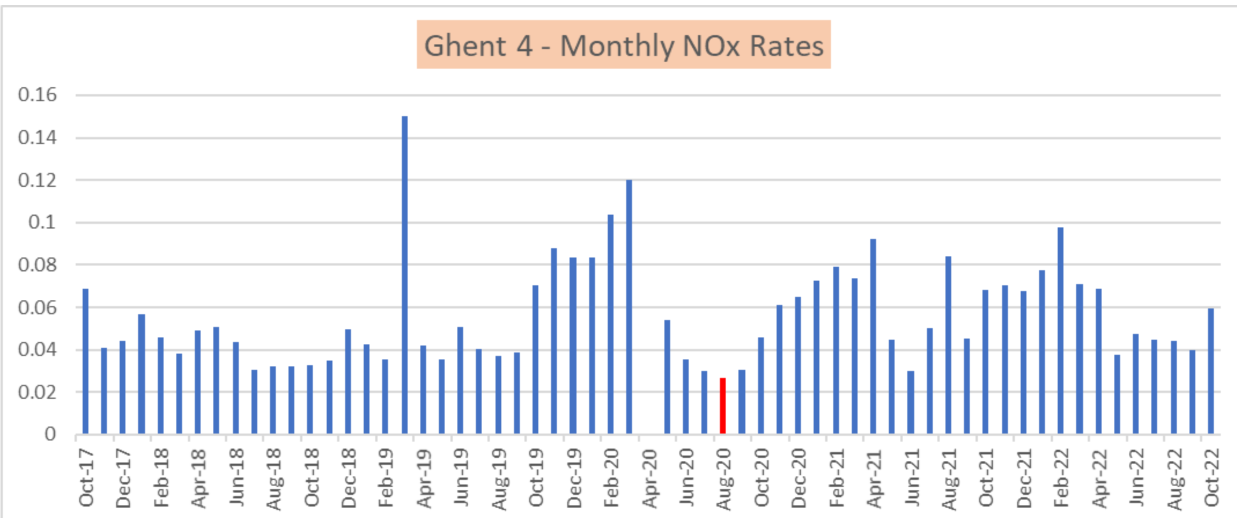


The chart above confirms that Ghent 3 consistently emits at very high NOx emissions rates, often in excess of 0.15 lb/MMBtu, even during ozone seasons, with a low of .0627 lb/MMBtu, shown in red. The chart below shows that Ghent 3's high emission rates are consistent over a wide range of ozone-season operating capacity factors.



Ghent 4: Unit 3 (556 MW) at the Ghent plant was analyzed. It has SCR installed. It can reliably achieve NOx emission rates below 0.04 lb/MMBtu. It is not operating its SCR consistently in accordance with its lowest demonstrated NOx reduction capacity, and it is not because of low capacity factor nor MOT issues as the charts below make clear.

Plant	Unit	MW	NOx, Min	Nox, Min (Historical)*	NOx, Max	NOx, Max 03 Months
Ghent	1	557	0.0292	N/A	0.1271	0.1271
Ghent	2	556	0.1383	0.1362	0.3045	0.2192
Ghent	3	557	0.0627	N/A	0.3012	0.2059
Ghent	4	556	0.0268	N/A	0.1504	0.0842



The chart above confirms that Ghent 4 has often achieved levels below 0.04 lb/MMBtu, with a low of .0268 lb/MMBtu, shown in red. The chart below shows that Ghent 4 has achieved less than 0.04 lb/MMBtu over a wide range of ozone-season operating capacity factors.