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November 15, 2022

Mr. Daniel Blackman
Regional Administrator
US EPA Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

RE: Ongoing Reporting Requirements for 2010 1-hour Sulfur Dioxide National Ambient Air Quality Standard

Dear Mr. Blackman:

On behalf of the Commonwealth of Kentucky, the Energy and Environment Cabinet's Division for Air Quality (Division) respectfully submits the following documentation to comply with the United States Environmental Protection Agency (EPA) Data Requirements Rule (DRR) ongoing reporting requirement for the 2010 1-hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR 51.1205(b), each state must submit an annual report to the EPA Regional Administrator that documents the annual SO_2 emissions of each source designated as unclassifiable/attainment, which utilized modeling as the basis for designation. The report must include a recommendation by the state regarding the need for additional modeling to assure that each area continues to meet the 2010 SO_2 NAAQS.

The attached report details the Division's review of the sources subject to the ongoing reporting requirements under the DRR. The Division recommends that no additional modeling is required at this time.

In accordance with 40 CFR 51.102, the proposed annual report was available for public review and comment beginning on October 5, 2022 and ending on November 4, 2022. The Cabinet did not receive any comments. A copy of the public notice is included with the report.

If you have any questions or concerns, please contact Ms. Kelly Lewis, Program Planning and Administrative Branch Manager, Division for Air Quality at (502) 782-6687 or kelly.lewis@ky.gov.

Sincerely,

Recoverable Signature

X Michael Kennedy

Signed by: Michael Kennedy

Michael Kennedy, P.E. Director

Cc: Caroline Freeman, Region 4 US EPA
Lynorae Benjamin, Region 4 US EPA

Kentucky
Sulfur Dioxide Ongoing Data Requirements Rule
2022 Annual Report for Modeled Sources

Prepared by the
Kentucky Division for Air Quality
Submitted by the
Kentucky Energy and Environment Cabinet

November 2022

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I. Introduction

The Kentucky Energy and Environment Cabinet (Cabinet) submits this report to the U.S. Environmental Protection Agency (EPA) for the Annual Ongoing Data Requirement Rule (DRR) for the 2010 1-hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS). This report is intended to fulfill the annual reporting requirements of 40 CFR Part 51 Subpart BB.

On August 21, 2015, the EPA promulgated the DRR for the 2010 1-hour SO_2 Primary NAAQS of 75 parts per billion (ppb).[1] The DRR requires areas that are in attainment to characterize ambient air quality for facilities that emit more than 2,000 tons per year (tpy) of SO_2. Characterization of air quality can occur by choosing one of three methods: (1) ambient air monitoring; (2) air dispersion modeling of either actual or allowable emissions; or (3) demonstration of enforceable emissions limitations that are below the 2,000 tpy threshold.

On January 6, 2017, the Cabinet submitted a letter and air dispersion modeling analyses to EPA characterizing nine sources subject to the DRR. The letter also detailed Kentucky sources that chose the monitoring or federally enforceable limitation options, as well as sources that permanently shut down. Two of the nine sources are not included in this report: Big Rivers – D. B. Wilson and TVA – Paradise. D. B. Wilson was designated unclassifiable and is not subject to ongoing verification. TVA – Paradise was modeled using potential to emit (PTE) emissions and is not subject to ongoing verification.

In accordance with 40 CFR 51.1205(b), areas designated as attainment/unclassifiable and characterized using air dispersion modeling of actual SO_2 emissions are subject to ongoing data requirements. Annual emissions reports for those areas must be submitted to EPA by July 1 of each year.

[1] 80 FR 51052

II. Emissions Data Summary

On January 9, 2018, EPA designated seven Kentucky counties containing the sources characterized by modeled actual emissions as attainment/unclassifiable.[2] The seven Kentucky counties and their respective DRR sources subject to ongoing emissions data verification are identified in Table 1.

Table 1
Sources Subject to the DRR

Source	County
Duke Energy - East Bend	Boone
East Kentucky Power Cooperative (EKPC) - Hugh L. Spurlock	Mason
Kentucky Utilities (KU) - Ghent	Carroll
Louisville Gas and Electric (LG&E) - Trimble County	Trimble
Tennessee Valley Authority (TVA) – Shawnee	McCracken
Century Aluminum - Hawesville	Hancock
Owensboro Municipal Utilities (OMU) - Elmer Smith	Daviess

The five electric generating units (EGUs) that chose to model actual SO_2 emissions for the model years 2012-2014 are displayed in Table 2. The SO_2 emissions modeled for 2012-2014 are compared to 2019-2021 actual SO_2 emissions. For two of the five facilities (Duke Energy – East Bend, and LG&E – Trimble County), emissions decreased from 2020 to 2021. SO_2 emissions at EKPC – H. L. Spurlock, KU – Ghent, and TVA - Shawnee increased in 2021 when compared to the previous year (2020). Although these facilities' emissions have increased over the last year, Table 4 shows the average emissions for the three most recent years are lower than the average of the modeled years.

Table 2
Annual SO_2 Emissions for Sources Using MY 2012-2014 (tpy)

Source	Modeled Emissions			Actual Emissions		
	2012	2013	2014	2019	2020	2021
Duke Energy – East Bend	1,496.63	2,197.72	2,102.71	2,402.84	1,932.15	1,755.68
EKPC – H. L. Spurlock	5,131.11	4,468.75	4,689.09	2,972.66	3,831.41	3,968.02
KU – Ghent	10,772.18	13,421.85	14,851.28	8546.38	8,600.66	11,059.99
LG&E – Trimble County	2,895.83	3,521.39	3,056.20	3,966.34	3,747.99	2,900.79
TVA – Shawnee	27,114.87	27,210.73	29,834.54	16,345.72	9,024.44	14,696.44

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

Listed in Table 3 are the two facilities that chose to model actual SO_2 emissions for the model years 2014-2016. The SO_2 emissions for Century Aluminum – Hawesville decreased from 2020 to 2021. OMU – Elmer Smith had a large drop in emissions from 2020 to 2021. On August 12, 2020, OMU notified the Cabinet that Units 1 and 2 were effectively retired on June 1, 2020. OMU submitted the Retired Unit Exemption for Units 1 and 2 to the Cabinet and EPA on

[2] 83 FR 1098

July 23, 2020. The Cabinet plans to work with EPA to allow OMU – Elmer Smith to discontinue the SO_2 DRR annual reporting requirement.

Table 3
Annual SO_2 Emissions for Sources Using MY 2014-2016 (tpy)

Source	Modeled Emissions			Actual Emissions		
	2014	2015	2016	2019	2020	2021
Century Aluminum – Hawesville*	2,223.56	1,604.46	507.04	1,574.57	1,575.96	1,495.06
OMU – Elmer Smith**	5,741.38	3,901.59	2,448.69	1,977.34	586.94	0

*Emissions data acquired from the Kentucky Division for Air Quality Emissions Inventory
** Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

The averaged actual emissions from the most recent three years of data, the averaged emissions of the modeled years, and the percent change between the two are compared in Table 4. Five of the seven facilities show a decrease in actual emissions when compared to the modeled years' emissions. Two facilities have an increase in emissions (Duke Energy – East Bend and LG&E – Trimble County). Duke Energy – East Bend emissions increased by 5% and LG&E – Trimble County emissions increased by 12%.

Table 4
SO_2 Emissions Comparisons (tpy)

Source	Modeled Emissions Average	Actual Emissions Average	Percent Change
	2012-2014	2019-2021	
Duke Energy – East Bend**	1,932.35	2,030.22	5%
EKPC – H. L. Spurlock**	4,762.98	3,590.70	-24%
KU – Ghent**	13,015.10	9,402.34	-27%
LG&E – Trimble County**	3,157.81	3,538.37	12%
TVA – Shawnee**	28,053.38	13,355.53	-52%
Source	**Modeled Emissions Average**	**Actual Emissions Average**	**Percent Change**
	2014-2016	**2019-2021**	
Century Aluminum – Hawesville*	1,445.02	1,548.53	7%
OMU – Elmer Smith**	4,030.55	854.76	-79%

*Emissions data acquired from the Kentucky Division for Air Quality Emissions Inventory
**Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

III. Facility Analysis to Determine Updated Modeling Recommendation

As part of the ongoing reporting, Kentucky must perform an annual review of SO_2 emissions for facilities and, if necessary, provide a recommendation for updated modeling due to increases in SO_2 emissions. As mentioned, EKPC - H.L. Spurlock, KU – Ghent and TVA – Shawnee SO_2 emissions increased from 2020 to 2021. SO_2 emissions at EKPC – H.L. Spurlock increased by 137 tpy, KU – Ghent had an increase of 2,459 tpy and TVA – Shawnee increased by 5,672 tpy. The emissions increase at EKPC – H.L. Spurlock is not significant and is lower than the increase shown in the 2021 SO_2 DRR Annual Report. Emissions at KU – Ghent and TVA – Shawnee increased between 2020 and 2021; however, the percent change between the 2019-2021 actual emissions and the 2012-2014 modeled emissions have decreased for both facilities. As long as actual emissions for the current three years are below the modeled emissions, no further action is necessary.

Although the percent change between the 2019-2021 actual emissions and the 2012-2014 modeled emissions increased for Duke Energy – East Bend and LG&E – Trimble County, annual emissions for both facilities have decreased in the past three years. The following sections demonstrate that the total SO_2 emissions in the modeled areas have decreased overall and that monitors are maintaining the 2010 SO_2 1-hour NAAQS.

Duke Energy – East Bend

The initial modeling characterization for Duke Energy – East Bend includes KU – Ghent in Kentucky, and Dynegy – Miami Fort in Ohio. The resulting modeled emissions and actual emissions of SO_2 for the three facilities are shown in Table 5 and Figure 1. Since the modeling analysis, Duke Energy – East Bend has seen a decrease in SO_2 emissions. Although the averaged most recent three-year data shows SO_2 emissions higher than the modeled emissions, actual SO_2 emissions decreased from 2019 to 2021.

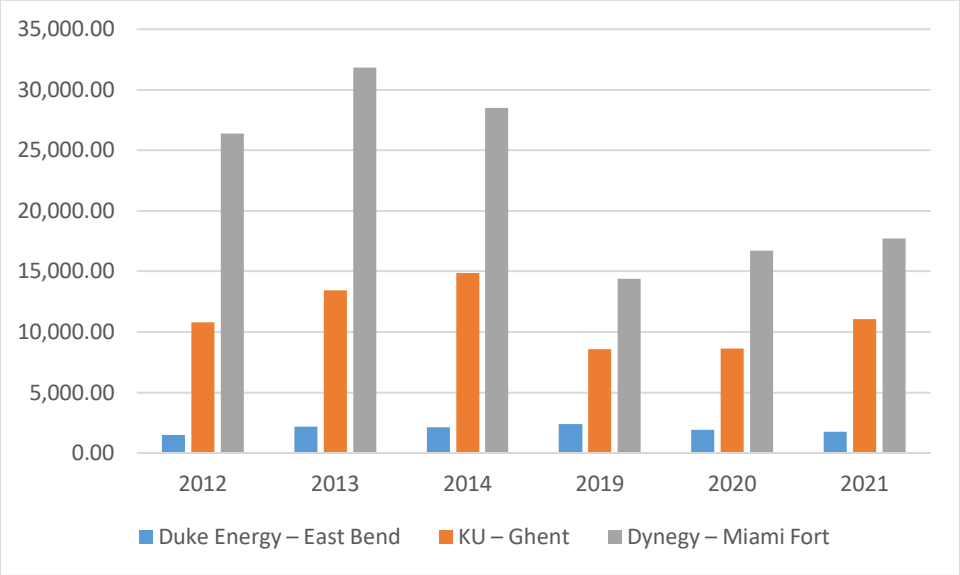
The Cabinet's 2020 SO_2 DRR Annual Report for 2019 emissions data, submitted to EPA on October 5, 2020, assessed the most recent SO_2 emissions for Duke Energy – East Bend, comparing the averaged 2017-2019 actual emissions to the averaged model years. The average percent change in 2020 was higher (21.54%) than the current emissions comparison (5%). The Cabinet reached out to Duke Energy while compiling the 2020 annual report and requested that they identify the reason for the increase. Duke Energy's response identified an increase in utilization at the East Bend facility as the cause for the increase in SO_2 emissions. Appendix A contains Duke Energy's explanation for the increase, which was submitted to the Cabinet for review.

Table 5
Duke Energy – East Bend, KU – Ghent, Dynegy – Miami Fort
Annual SO_2 Emissions (tpy)

Facility	Modeled Emissions			Actual Emissions		
	2012	2013	2014	2019	2020	2021
Duke Energy – East Bend	1,496.63	2,197.72	2,102.71	2,402.84	1,932.15	1,755.68
KU – Ghent	10,772.18	13,421.85	14,851.28	8,546.38	8,600.66	11,059.99
Dynegy – Miami Fort	26,406.88	31,843.92	28,478.67	14,396.51	16,729.51	17,737.82
Area Total	**38,675.69**	**47,463.49**	**45,432.66**	**25,345.73**	**27,262.32**	**30,553.49**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

Figure 1
Duke Energy – East Bend; KU – Ghent; Dynegy – Miami Fort
Annual SO_2 Emissions (tpy)



As seen in Table 5, SO_2 emissions at the KU – Ghent facility have increased in the past three years; however, Table 6 shows a 28% decrease between the total 2019-2021 SO_2 emissions and the total 2012-2014 modeled emissions. Although Duke Energy – East Bend's current emissions are higher than the modeled emissions, there was a 37% overall decrease of SO_2 emissions in the area from KU – Ghent and Dynegy – Miami Fort, which greatly offset the increase at East Bend.

Table 6
Duke Energy – East Bend, KU – Ghent, Dynegy – Miami Fort Modeled Area Percent Change in SO_2 Emissions (tpy)

Facility	Total Emissions 2012-2014	Total Emissions 2019-2021	Percent Change
Duke Energy – East Bend	5,797.06	6,090.67	5%
KU – Ghent	39,045.31	28,207.03	-28%
Dynegy – Miami Fort	86,729.47	48,863.83	-44%
Area Total	**131,571.84**	**83,161.52**	**-37%**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 170 µg/m3, equivalent to 65 ppb. The modeled concentrations include the actual emissions from the facilities and the background concentrations of SO_2. The model shows the highest concentrations occurred near the KU – Ghent facility. The concentrations modeled near Duke Energy - East Bend were well below the 1-hour SO_2 NAAQS.[3] It is conceivable that the decrease of emissions in the area would result in a lower daily maximum concentration. In support of this theory, Table 7 highlights the improvement in air quality as a result of lower emissions in the modeled area.

Data from the NKU monitor (site ID 21-037-3002) was used to calculate background concentrations for East Bend. As stated above, the cumulative modeling analysis indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 65 ppb. Current ambient air data from the NKU monitor indicates a 2019-2021 design value of 9 ppb, which is well below 75 ppb. The latest complete three-year design value (2019-2021) shows an 88% decrease from the 2012-2014 design value. Therefore, the overall decrease in SO_2 emissions in the modeled area has improved air quality.

Table 7
NKU SO_2 Monitor 99th Percentile (ppb)

2012	2013	2014	2012-2014 Design Value	2019	2020	2021	2019-2021Design Value	Percent Change
85	71	61	72	8	10	9	9	-88%

Data retrieved from EPA Outdoor Air Quality Monitor Values Report

The average three current years of data show SO_2 emissions at Duke Energy – East Bend are currently higher than the averaged three model years emissions. In contrast, SO_2 emissions at the facility have decreased over the last three years. Although emissions at KU – Ghent and Dynegy – Miami Fort have increased over the past few years, the total emissions for the area is 37% less than the emissions used for modeling. Considering current emissions are below the

[3] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb, the Cabinet has determined that updated modeling is not needed at this time.

East Kentucky Power Cooperative – Hugh L. Spurlock

SO_2 emissions at the EKPC – H.L. Spurlock facility have increased over the past three years (2019-2021). The Cabinet requested the facility provide additional information explaining the emissions increase. The response is included in Appendix B. H.L. Spurlock explains the increase is due to an increased utilization of the facility in response to its members' needs and its participation in the regional transmission organization (PJM Interconnection). Although actual SO_2 emissions at the H.L. Spurlock facility increased from 2019 to 2021, current emissions at the facility, and within the modeled area, are less than the emissions used in the modeling analysis, as seen in Table 8.

The initial modeling characterization for EKPC – H.L. Spurlock includes Applied Energy Services - Dayton Power and Light (AES-DP&L) – Stuart Station and AES-DP&L – Killen Station in Ohio. The resulting modeled emissions and actual emissions of SO_2 for the three facilities are shown in Table 8 and Figure 2. Coal-fired boilers at the AES-DP&L – Stuart and Killen facilities were permanently shutdown by June 1, 2018, resulting in a significant decrease of SO_2 emissions in the area.

Table 8
EKPC – H.L. Spurlock, AES-DP&L – Stuart, AES-DP&L - Killen
Annual SO_2 Emissions (tpy)

Facility	Modeled Emissions			Actual Emissions		
	2012	2013	2014	2019	2020	2021
EKPC – H.L.Spurlock	5,131.11	4,468.75	4,689.09	2,972.66	3,831.41	3,968.02
AES-DP&L – Stuart	8,864	11,542	10,852	0	0	0
AES-DP&L – Killen	5,362	7,885	13,096	0	0	0
Area Total	**19,357.11**	**23,895.75**	**28,637.09**	**2,972.66**	**3,831.41**	**3,968.02**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

Figure 2
EKPC – H.L. Spurlock, AES-DP&L – Stuart, AES-DP&L - Killen
Annual SO_2 Emissions (tpy)

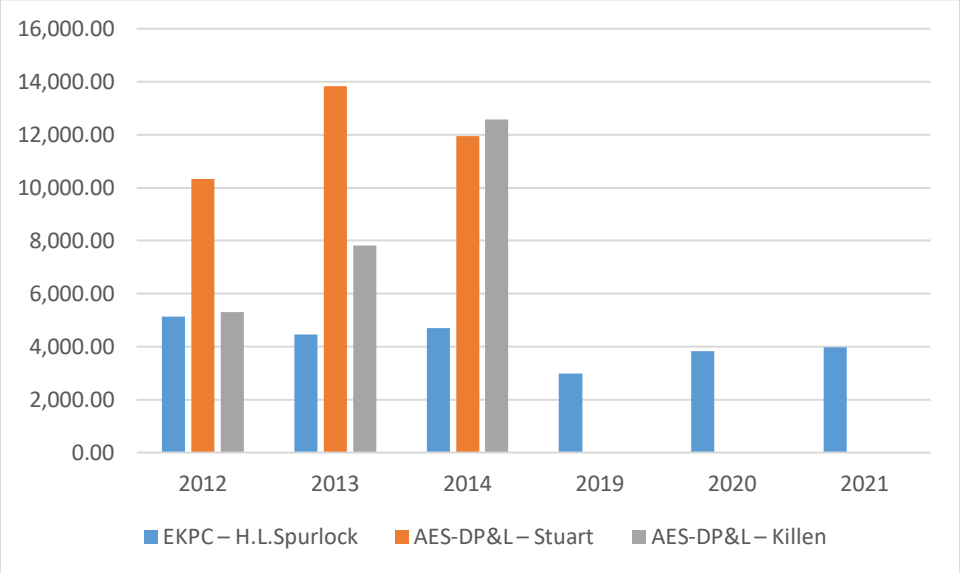


Table 9 shows that current SO_2 emissions at H.L. Spurlock are 25% less than the modeled emissions. The shutdown of the Stuart and Killen facilities had a significant impact on area emissions, resulting in an 85% decrease in area emissions when compared to the total area emissions used in the model.

Table 9
EKPC – H.L. Spurlock
Area Percent Change in SO_2 Emissions (tpy)

Facility	Total Emissions 2012-2014	Total Emissions 2019-2021	Percent Change
EKPC – H.L.Spurlock	14,288.95	10,772.09	-25%
AES-DP&L – Stuart	31,258	0	-100%
AES-DP&L – Killen	26,343	0	-100%
Area Total	**71,889.95**	**10,772.09**	**-85%**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 194.1 µg/m3, equivalent to 74.1 ppb. The modeled concentrations include the actual emissions from the facilities and the background concentrations of SO_2. The model shows the highest concentrations occurred approximately 12 km southeast of Spurlock Station near Stuart Station. The concentrations modeled near H.L. Spurlock were below the 1-hour SO_2 NAAQS.[4] The

[4] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

significant reduction of SO_2 emissions by the modeled facilities would result in a lower modeled concentration. Therefore, it is improbable that re-running the model would show a modeled concentration above the 2010 1-hour SO_2 NAAQS.

Data from the West Union monitor (site ID 39-001-0001), located in Adams County, Ohio, was used to calculate background concentrations for H.L. Spurlock. In December 2020, the Ohio EPA Air Pollution Control Division discontinued the West Union monitor and did not establish a replacement monitor. The most recent complete three-year design value (2018-2020) shows an 77% decrease from the 2012-2014 design value. The 2018-2020 SO_2 design value for the H.L. Spurlock background monitor is 6 ppb, which is well below 75 ppb.

Table 10
West Union SO_2 Monitor 99th Percentile (ppb)

2012	2013	2014	2012-2014 Design Value	2018	2019	2020	2018-2020 Design Value	Percent Change
29	24	24	26	7	5	5	6	77%

Data retrieved from EPA Outdoor Air Quality Monitor Values Report

The three current years of data show SO_2 emissions at EKPC – H.L. Spurlock have slightly increased. However, SO_2 emissions from 2019-2021 are 25% less than the 2012-2014 modeled emissions. Additionally, the shutdown of the coal units at the AES-DP&L – Stuart and Killen facilities has resulted in an 85% decrease in SO_2 emissions in the total modeled area. Considering current emissions are below the modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb, the Cabinet has determined that updated modeling is not needed at this time.

Kentucky Utilities - Ghent

SO_2 emissions at the KU - Ghent facility have increased over the past three years (2019-2021). The Cabinet requested the facility provide additional information explaining the emissions increase. The response is included in Appendix C. Ghent explains the increase is due to an increased utilization of the facility, higher sulfur content in the fuel, and a slight decrease in Flue Gas Desulfurization (FGD) control efficiency. Individual unit utilization varies annually based on electricity usage rates, fuel costs, and planned outages. Although actual SO_2 emissions at the Ghent facility increased from 2019 to 2021, current emissions at the facility, and within the modeled area, are less than the emissions used in the modeling analysis, as seen in Table 11.

The initial modeling characterization for KU - Ghent included LG&E – Trimble County, Duke Energy – East Bend and Indiana-Kentucky Electric Corporation (IKEC) – Clifty Creek station. Table 11 and Figure 3 contains the area emissions from the modeled years and the recent three-year actual emissions of SO_2 for the four facilities. Table 11 shows SO_2 emissions at KU – Ghent increasing between 2019 and 2021. Although there has been a slight emissions increase at KU – Ghent over the past three years, emissions in the current three years are still less than the modeled emissions. SO_2 emissions at LG&E – Trimble County, Duke Energy – East Bend, and

IKEC – Clifty Creek have steadily decreased over the past three years, contributing to an overall decrease of SO_2 emissions in the modeled area.

The largest contributor to the decrease of area emissions was due to the emissions limit established by IKEC – Clifty Creek. On February 1, 2016, Indiana issued Commissioner's Order 2016-02 to establish a combined emission limit for the six coal-fired boilers at Clifty Creek, which have reduced SO_2 concentrations in the area. The boilers were limited to a total of "2,624.5 lbs. of SO_2 per hour as a 720 operating hour rolling average when any of Units No.1 through No. 6, or any combination thereof, is operating."[5] In 2016, Clifty Creek took a limit of 11,495 tpy allowable emissions of SO_2. As seen in Table 11, the most recent actual emissions at Clifty Creek are significantly lower than the modeled emissions.

Table 11
KU – Ghent, LG&E – Trimble County, IKEC – Clifty Creek
Annual SO_2 Emissions (tpy)

Facility	Modeled Emissions			Actual Emissions		
	2012	2013	2014	2019	2020	2021
KU – Ghent	10,772.18	13,421.85	14,851.28	8,546.38	8,600.66	11,059.99
LG&E – Trimble County	2,895.83	3,521.39	3,056.20	3,966.34	3,747.99	2,900.79
Duke Energy – East Bend	1,496.63	2,197.72	2,102.71	2,402.84	1,932.15	1,755.68
IKEC – Clifty Creek	52,838.92	19,562.58	3,731.23	4,191.13	2,537.01	2,906.51
Area Total	**66,506.93**	**36,505.82**	**21,638.71**	**16,703.85**	**14,885.66**	**16,867.29**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

[5] 81 FR 27331

Figure 3
KU – Ghent, LG&E – Trimble, Duke Energy – East Bend and IKEC – Clifty Creek
Annual SO_2 Emissions (tpy)

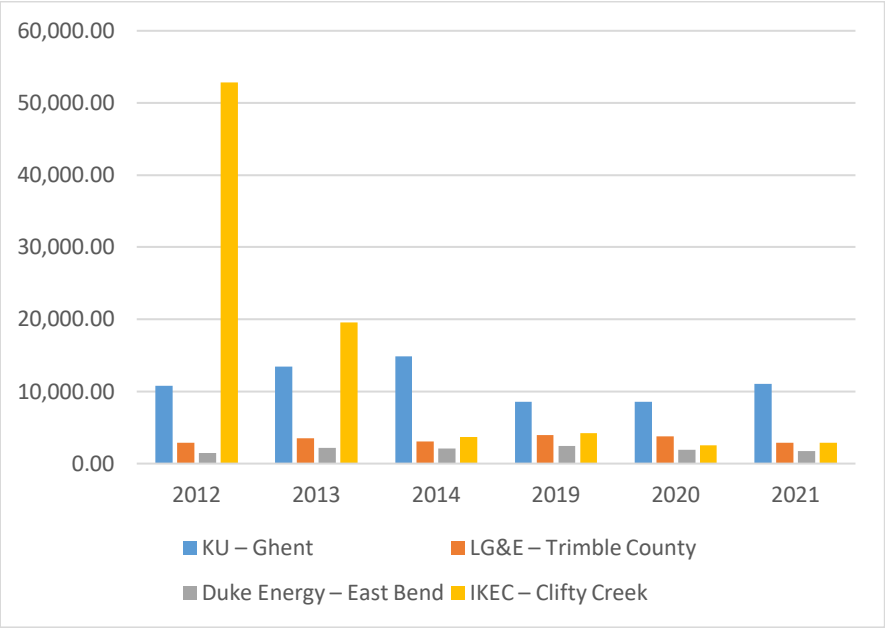


Table 12 shows the percent change between the 3 modeled year totals compared to the most recent 3 years of data. The SO_2 emissions at KU – Ghent have decreased 28%. Although the current emission totals for Trimble County and East Bend have slightly increased, reductions at the Ghent and Clifty Creek facilities have decreased significantly and the emissions for the total area have decreased 58%. The current area emissions are less than the modeled year emissions.

Table 12
KU - Ghent Area Percent Change in SO_2 Emissions

Facility	2012-2014 Area Emissions (Tons)	2019-2021 Area Emissions (Tons)	Percent Change
KU – Ghent	39,045.31	28,207.03	-28%
LG&E - Trimble County	9,473.42	10,615.12	12%
Duke Energy – East Bend	5,797.06	6,090.67	5%
IKEC – Clifty Creek	76,132.73	9,634.65	-87%
Area Total	**130,448.52**	**54,547.47**	**-58%**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 188 µg/m3, equivalent to 71.8 ppb. [3] The modeled concentrations include the actual emissions from the facilities and the background concentration of SO_2. The model shows the highest concentrations occurred near the IKEC – Clifty Creek facility. The concentrations modeled near Ghent were below the 1-hour SO_2 NAAQS.[6] The reduction of SO_2 emissions by the modeled facilities would result in a lower modeled concentration. Therefore, it is improbable that re-running the model would show a modeled concentration above the 2010 1-hour SO_2 NAAQS.

The original modeling characterization used Indiana's Green Valley Rd/Green Valley Elementary School monitor (site ID 18-043-1004). Table 13 demonstrates the significant reduction of emissions in the area. Between the 2012-2014 design value and the 2019-2021 design value, there is an 88% percent decrease at the Green Valley monitor.

Table 13
Green Valley SO_2 Monitor 99th Percentile (ppb)

2012	2013	2014	2012-2014 Design Value	2019	2020	2021	2019-2021 Design Value	Percent Change
32	21	44	32	5	5	4	4	-88%

Data retrieved from EPA Outdoor Air Quality Monitor Values Report

As stated above, the cumulative modeling analysis indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 71.8 ppb. Current ambient air data from the Green Valley monitor indicates a 2019-2021 design value of 4 ppb, which is well below 75 ppb. The design value for the Green Valley monitor has decreased significantly since 2012-2014.

Although the three current years of data show SO_2 emissions at KU – Ghent have increased, SO_2 emissions from 2019-2021 are 28% less than that 2012-2014 modeled emissions. Additionally, the emissions limit on the six coal-fired boilers at the Clifty Creek facility has contributed to the 58% decrease of emissions in the modeled area. Considering current emissions are below the modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb, the Cabinet has determined that updated modeling is not needed at this time.

Louisville Gas & Electric - Trimble County

The initial modeling characterization for LG&E – Trimble County included IKEC – Clifty Creek station and KU – Ghent. Table 14 and Figure 4 contain the area emissions from the modeled years and the recent three-year actual emissions of SO_2 for the three facilities. Table 14 shows SO_2 emissions at LG&E – Trimble County steadily decreasing over the past three years.

[6] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

KU – Ghent emissions increased between 2020 and 2021; however, the total area emissions are well below the 2012-2014 modeled emissions.

The Cabinet's 2020 SO_2 DRR Annual Report, submitted to EPA on October 5, 2020, assessed the most recent SO_2 emissions for LG&E – Trimble County, comparing the averaged 2017-2019 actual emissions to the averaged model years. The average percent change in 2020 was higher (20%) than the current emissions comparison (12%). The Cabinet reached out to LG&E while compiling the 2020 SO_2 DRR Annual Report and requested that they identify the reason for the increase. LG&E's response identified an increase in utilization at the Trimble County facility as the cause for the increase in SO_2 emissions. Appendix D contains LG&E's explanation for the increase, which was submitted to the Cabinet for review.

The largest contributor to the decrease of area emissions was due to the emissions limit established by IKEC – Clifty Creek. On February 1, 2016, Indiana issued Commissioner's Order 2016-02 to establish a combined emission limit for the six coal-fired boilers at Clifty Creek, which have reduced SO_2 concentrations in the area. The boilers were limited to a total of "2,624.5 lbs. of SO_2 per hour as a 720 operating hour rolling average when any of Units No.1 through No. 6, or any combination thereof, is operating."[7] In 2016, Clifty Creek took a limit of 11,495 tpy allowable emissions of SO_2. As seen in Table 14, the most recent actual emissions at Clifty Creek are significantly lower than the modeled PTE emissions.

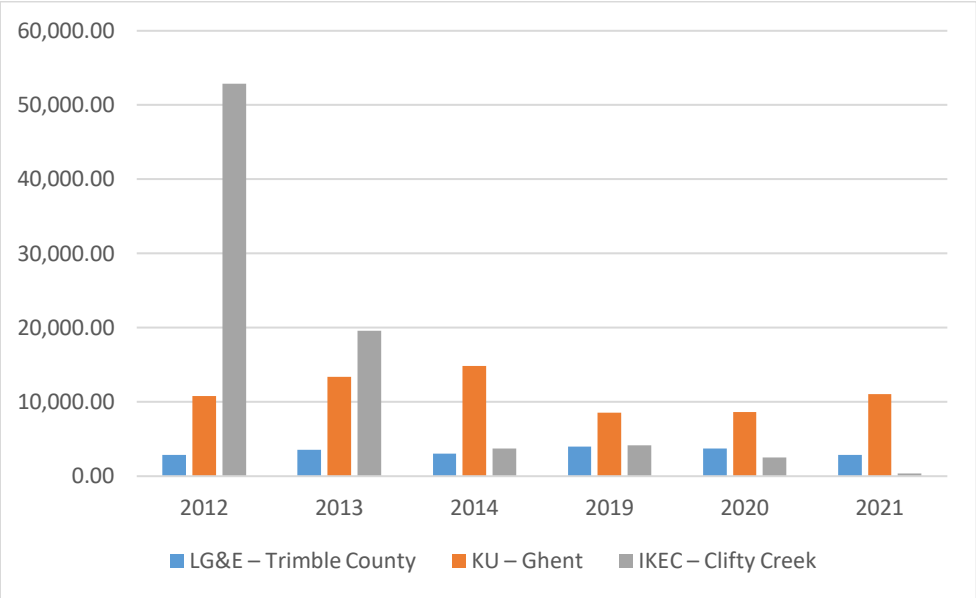
Table 14
LG&E – Trimble County, KU – Ghent, IKEC – Clifty Creek
Annual SO_2 Emissions (tpy)

Facility	Modeled Emissions			Actual Emissions		
	2012	2013	2014	2019	2020	2021
LG&E – Trimble County	2,895.83	3,521.39	3,056.20	3,966.34	3,747.99	2,900.79
KU – Ghent	10,772.18	13,421.85	14,851.28	8,546.38	8,600.66	11,059.99
IKEC – Clifty Creek	52,838.92	19,562.58	3,731.23	4,191.13	2,537.01	2,906.51
Area Total	**66,506.93**	**36,505.82**	**29,402.48**	**16,703.85**	**14,885.66**	**16,867.29**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

[7] 81 FR 27331

Figure 4
LG&E – Trimble, KU – Ghent, and IKEC – Clifty Creek
Annual SO_2 Emissions (tpy)



LG&E – Trimble County's emissions have steadily decreased over the past three years. Table 15 demonstrates that even though there is a percent increase between current emissions and modeled emissions for the LG&E – Trimble County facility, the area overall had a decrease of 61%. The current area emissions are well below the modeled year emissions. Evidence that current emissions are not impacting the area around the three facilities is verified through monitoring data which is discussed below.

Table 15
LG&E – Trimble County Area Percent Change in SO_2 Emissions

Facility	2012-2014 Area Emissions (Tons)	2019-2020 Area Emissions (Tons)	Percent Change
LG&E - Trimble County	9,473.42	10,615.11	12%
KU – Ghent	39,045.31	28,207.03	-28%
IKEC – Clifty Creek	76,132.73	9,634.65	-87%
Area Total	**124,651.46**	**48, 456.79**	**-61%**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 188 µg/m3, equivalent to 65 ppb. The modeled concentrations include the actual emissions from the facilities and the background concentration of SO_2. The model shows the highest

concentrations occurred near the IKEC – Clifty Creek facility. The concentrations modeled near LG&E Trimble County were well below the 1-hour SO_2 NAAQS.[8]

The original modeling characterization used Indiana's Green Valley Rd/Green Valley Elementary School monitor (site ID 18-043-1004). Table 16 demonstrates the significant reduction of emissions in the area. Between the 2012-2014 design value and the 2019-2021 design value, there is an 88% percent decrease at the Green Valley monitor.

Table 16
Green Valley SO_2 Monitor 99th Percentile (ppb)

2012	2013	2014	2012-2014 Design Value	2019	2020	2021	2019-2021 Design Value	Percent Change
32	21	44	32	5	5	4	4	-88%

Data retrieved from EPA Outdoor Air Quality Monitor Values Report

The design value for the LG&E – Trimble County cumulative modeling analysis was 188 $\mu g/m^3$ (Trimble's contribution was 0.3 $\mu g/m^3$), which was below the NAAQS value of 196 $\mu g/m^3$. The ambient air data from the Green Valley monitor indicates a 2019-2021 design value of 4 ppb, which is well below 75 ppb.

The average three current years of data show SO_2 emissions at LG&E – Trimble County are currently higher than the averaged emissions of the three model years. In contrast, SO_2 emissions at the facility have decreased over the last three years. Although emissions at KU – Ghent and IKEC – Clifty Creek have increased over the past few years, the total emissions for the area is 61% less than the emissions used for modeling. Considering current emissions are below the modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb, the Cabinet has determined that updated modeling is not needed at this time.

Tennessee Valley Authority - Shawnee

The initial modeling characterization for TVA - Shawnee included the Electric Energy Inc – Joppa Steam facility, Honeywell International Inc, and the Lafarge Midwest Inc – Portland facilities. The Honeywell and Lafarge facilities are not on the SO_2 DRR Source list but were included in the modeling analysis to best predict total modeled SO_2 concentrations in the McCracken County area. Table 17 and Figure 5 contain the area emissions from the modeled years and the recent three-year actual emissions of SO_2 for the four facilities. TVA – Shawnee, Electric Energy Inc – Joppa, and Lafarge Midwest have seen emissions increase in the last three years. However, current SO_2 emissions at all three facilities are less than the modeled emissions. The Honeywell International Plant was temporarily idled in 2018 due to a surplus of uranium hexafluoride (UF6) and a decrease of nuclear fuel demand in the global market. Honeywell anticipates restarting production of UF6 at the plant in 2023.

[8] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

TVA – Shawnee SO_2 emissions have fluctuated over the past three years. The Cabinet requested the facility provide additional information explaining the emissions increase between 2020 and 2021. The response is included in Appendix E. The Shawnee Plant saw a significant decrease in operation in 2020 due to the Coronovirus' impact on energy demand. The decrease in electricity demand was seen mostly from late March through June of 2020 and was atypical operation for the Shawnee Plant. As COVID restrictions eased, the electricity demand rose back to pre-pandemic levels in 2021 resulting in an increase of SO_2 emissions between 2020 and 2021. Although emissions increased between 2020 and 2021, current SO_2 emissions are less than the modeled emissions.

Table 17
TVA – Shawnee, Electric Energy Inc – Joppa, Honeywell International, and Lafarge Midwest
Annual SO_2 Emissions (tpy)

Facility	Modeled Emissions			Actual Emissions		
	2012	2013	2014	2019	2020	2021
TVA – Shawnee	27,115	27,211	29,835	16,346	9,024	14,696
Electric Energy Inc – Joppa	16,991	16,543	18,281	10,436	8,243	13,231
Honeywell International	163	59	144	0	0	0
Lafarge Midwest	494	551	490	209	269	309
Area Total	**44,763**	**44,364**	**48,750**	**26,991**	**17,536**	**28,236**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

Figure 5
TVA – Shawnee, Electric Energy Inc – Joppa, Honeywell International, and Lafarge Midwest
Annual SO_2 Emissions (tpy)

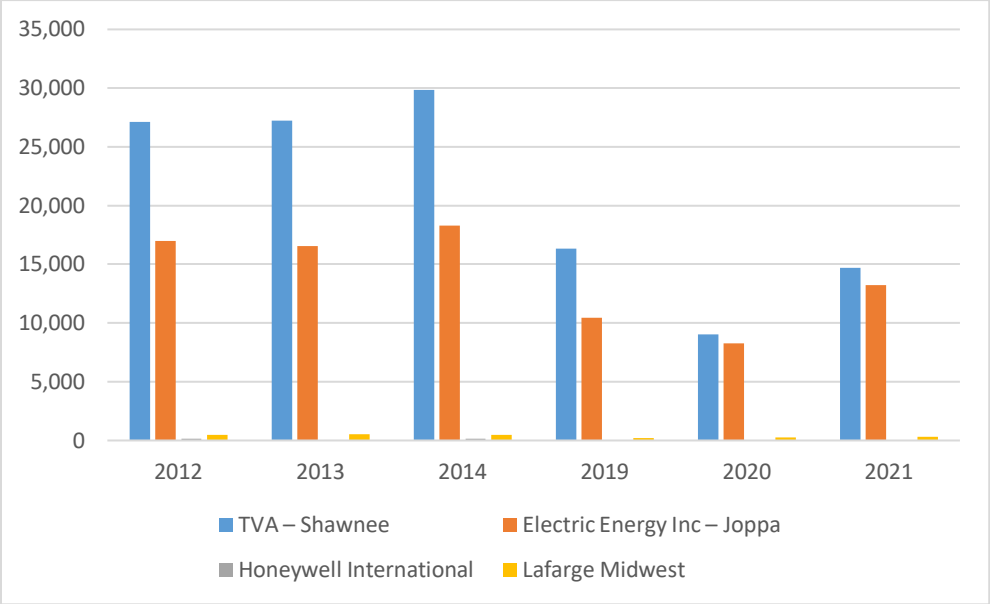


Table 18 shows the current three year total emissions compared to the three year totals of the modeled emissions. Each facility in the modeled area has decreased SO_2 emissions since

2012-2014 with an overall decrease of 47%. The current area emissions are well below the modeled year emissions. Evidence that current emissions are not impacting the area around the three facilities is verified through monitoring data which is discussed below.

Table 18
TVA - Shawnee Area Percent Change in SO_2 Emissions

Facility	2012-2014 Area Emissions (Tons)	2019-2020 Area Emissions (Tons)	Percent Change
TVA - Shawnee	84,161	40,066	-52%
Electric Energy Inc – Joppa	51,815	31,910	-38%
Honeywell International	366	0	-100%
Lafarge Midwest	1535	787	-49%
Area Total	**137,877**	**72,763**	**-47%**

Emissions data acquired from the Air Markets Program Data database - https://ampd.epa.gov/ampd/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 180.5 µg/m3, equivalent to 68.9 ppb. The modeled concentrations include the actual emissions from the facilities and the background concentration of SO_2. The model shows the highest predicted concentration occurred 12.66 km from the Shawnee Plant. The concentration modeled near TVA - Shawnee were below the 1-hour SO_2 NAAQS.[9]

The original modeling characterization used the Mammoth Cave National Park monitor (21-061-0501) located in Edmonson County, Kentucky. Table 19 demonstrates the significant reduction of emissions in the area. Between the 2012-2014 design value and the 2019-2021 design value, there is an 80% percent decrease at the Mammoth Cave monitor.

Table 19
Mammoth Cave National Park SO_2 Monitor 99th Percentile (ppb)

2012	2013	2014	2012-2014 Design Value	2019	2020	2021	2019-2021 Design Value	Percent Change
9	11	11	10	2	2	3	2	-80%

Data retrieved from EPA Outdoor Air Quality Monitor Values Report

As stated above, the cumulative modeling analysis indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 68.9 ppb. Current ambient air data from the Mammoth Cave monitor indicates a 2019-2021 design value of 2 ppb, which is well below 75 ppb. The design value for the Mammoth Cave monitor has decreased since 2012-2014.

[9] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

Although SO_2 emissions at TVA – Shawnee increased between 2020 and 2021 due to the impact of COVID on energy demand, SO_2 emissions from 2019-2021 are 52% less than that 2012-2014 modeled emissions. Considering current emissions are below the modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb, the Cabinet has determined that updated modeling is not needed at this time.

IV. Conclusion

The Cabinet has thoroughly reviewed SO_2 emissions trends and air monitoring data for all of the DRR sources that chose modelling to characterize ambient air quality. Although SO_2 emissions at Duke Energy – East Bend and LG&E – Trimble County have increased since the initial modeling characterization, those increases are offset by the significant SO_2 emissions reductions of the other modeled sources and SO_2 emissions, at both facilities, have decreased over the past three years. Emissions at EKPC – H.L. Spurlock, KU – Ghent, and TVA – Shawnee increased between 2020 and 2021, however, emissions have decreased at all three facilities since 2012-2014. Additionally, the ambient air monitoring design values for the nearby air monitoring stations have also dropped significantly. Therefore, the Cabinet determines that none of the seven sources require additional modeling to characterize ambient air quality.

V. Public Notice

In accordance with 40 CFR 51.102, the Cabinet made the report available for public inspection from October 5, 2022, to November 4, 2022. No comments were received during the public comment period. A copy of the public notice is available in the Appendix F.

Appendix A

Duke Energy East Bend Response

APPENDIX A

Duke Energy is providing this response to KDAQ's inquiry into the relative increase in SO_2 emissions from East Bend Generating Station between the model base year of 2012-2014 and 2017-2019.

The 22% increase in SO_2 emissions at East Bend Generating Station can be attributed to the following factors:

- An increase in the unit dispatch due to demand growth during 2017-2019. The increase in unit dispatch is reflected in a 3% increase in the Gross Megawatt output between 2012-2014 and 2017-2019.

- A lower SO_2 emissions rate during 2012, the first year of baseline modeling. The SO_2 emission rate during 2012 averaged 0.09 lbs/MMBtu, but was 0.12 and 0.13 lbs/MMBtu in 2013 and 2014. The annual average SO_2 lbs/MMBtu emissions rate has remained relatively consistent between years 2013 to 2019 with a range between 0.11 and 0.13 lb/MMBtu.

- Flow data is used to calculate the SO_2 mass emissions. A review of the flow data shows a step change in the flow rate occurred in 2014. In 2014, the CEMS flow monitor was replaced with a new monitoring device intended to provide more reliable and accurate flow measurement. While both the old monitor and the new monitor have been demonstrated to meet all EPA certification and operational requirements under 40 CFR 75 and 40 CFR 60, some of the apparent increase in emissions may be attributed to a step change in reported flow values after installation and certification of the new monitoring system.

Duke Energy does not believe the increase in the SO_2 emissions between 2012-2014 compared to 2017-2019 should trigger remodeling due to following modeled impacts:

- East Bend's contribution to the modeled design value, used to demonstrate attainment with the SO_2 NAAQS of 196.5 ug/m^3, was negligible. The modeled design value was 169.84 ug/m^3, which includes background concentrations and impacts from Ghent, Miami Fort and East Bend Generating Stations. East Bend's contribution to the modeled design value was only 0.05 ug/m^3.

- East Bend's impacts over the modeling domain was not significant. East Bend's 4th high daily max concentration, averaged over 3 years, at any one receptor, was only 23.707 ug/m^3.

- The background concentrations used in the initial modeling analysis were significantly impacted by nearby sources, resulting in overly conservative impacts. The SO_2 modeling analysis included background concentrations from the Northern Kentucky SO_2 monitoring site over the period from 2013-2015. The average background concentrations reflected in the annual 4th high daily max concentration, averaged over 3 years, was 86 ug/m^3. The 2017-2019 design value for the Northern Kentucky SO_2 monitor is 28.8 ug/m3 or 11 ppb.

Let me know if you have any questions or concerns.

Thanks

Patrick Coughlin

Appendix B

East Kentucky Power Cooperative - Spurlock Response

EAST KENTUCKY POWER COOPERATIVE

August 12, 2022

Leslie Poff
Kentucky Division for Air Quality
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601

RE: Hugh L. Spurlock Generating Station
1-Hour SO_2 Ongoing Data Requirements

Dear Ms. Poff,

East Kentucky Power Cooperative, Inc. (EKPC) is pleased to assist the Kentucky Division for Air Quality (KDAQ) in meeting its ongoing data requirements regarding the 1-Hour Sulfur Dioxide (SO_2) National Ambient Air Quality Standards (NAAQS) under the Data Requirements Rule (DRR).

EKPC has reviewed 2019, 2020, and 2021 Clean Air Markets Division (CAMD) SO_2 data for its Hugh L. Spurlock Generating Station (Spurlock) that you provided in your August 9, 2022 email. As you noted, SO_2 emissions increased over the three-year period with 2019 emissions of 2,973 tons, 2020 emissions of 3,831 tons, and 2021 emissions of 3,968 tons. As shown in CAMD, the annual SO_2 emission increases are a direct result of increased utilization of the facility over the course of the three years as shown by the facility's heat input: (1) 2019 heat input – 61,168,168 MMBtu; (2) 2020 heat input – 73,851,756 MMBtu; and (3) 2021 heat input – 85,028,757 MMBtu. The emission rates have not changed, the load demand has increased. EKPC's utilization of Spurlock is driven by its members' needs and its participation in PJM, the regional transmission organization.

EKPC would also like to note that the 2021 SO_2 emissions (the highest of the three years) are still below the emissions used in the 2016 modeling to demonstrate compliance with the 1-hour SO_2 NAAQS: EKPC used emissions from 2012, 2013, and 2014, which had emissions of 5131 tons per year,; 4469 tons per year, and 4689 tons per year, respectively. Thus, there is no reason to suspect that the Spurlock 2019, 2020, or 2021 SO_2 emissions have interfered with EKPC's previous 1-hour SO_2 NAAQS compliance demonstration.

If you have any questions or need additional information, please do not hesitate to contact me at (859) 745-9244.

Sincerely

Jerry Purvis

Jerry Purvis
Vice President, Environmental Affairs

4775 Lexington Road
P.O. Box 707
Winchester, Kentucky 40392
www.ekpc.coop
A Touchstone Energy® Cooperative

cc: Michael Kennedy, DAQ
Don Mosier, EKPC
David Smart, EKPC
Joseph VonDerHaar, EKPC
Kevin Moore, EKPC

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Winchester, Kentucky 40392
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Appendix C

Kentucky Utilities – Ghent Response

From: Burfict, Brandan
To: Poff, Leslie M (EEC)
Cc: Lewis, Kelly (EEC); Kennedy, Michael (EEC); Imber, Philip; Pardee, Marlene Zeckner
Subject: RE: 1-Hour SO2 Ongoing Data Requirements
Date: Friday, August 19, 2022 1:22:14 PM

Ms. Poff,

Kentucky Utilities (KU) Ghent Generating Station's variation in SO_2 emissions can be attributed to an increase in utilization coupled with higher sulfur content in our fuel and a slight decrease in FGD control efficiency. Individual unit utilization varies annually based on electricity usage rates, fuel costs, planned outages, etc.

In addition, the submitted modeling results also included contributions from the LKE Trimble County Generating Station. In the time periods specified below, the Ghent SO_2 emissions decreased by 27.76%. Combining emissions from both LKE sources, data shows there is a 20.05% decrease in SO_2 emissions from the LKE sources when comparing the 2012-2014 modeled time period to the 2019-2021 time period. Thus, further validating the modeled results in demonstrating attainment with the 1 hr SO_2 NAAQS.

Source	Modeled Years (tpy)			Subsequent Years (tpy)		
	2012	2013	2014	2019	2020	2021
KU - Ghent	10772.4	13421.9	14851.2	8546.38	8600.66	11059.99

Source	Average 2012-2014 (tpy)	Average 2019-2021 (tpy)	Average Percent Change
KU – Ghent	13015.17	9402.34	-27.76%

Source	Modeled Years (tpy)			Subsequent Years (tpy)		
	2012	2013	2014	2019	2020	2021
Ghent & Trimble	13668.23	16943.29	17907.4	12491.458	12348.228	13950.45

Source	Average 2012-2014 (tpy)	Average 2019-2021 (tpy)	Average Percent Change
Ghent & Trimble	16172.97	12930.05	-20.05%

Brandan Burfict

Manager, Environmental Air | Environmental Affairs | LG&E and KU

220 West Main Street, Louisville, KY 40202
M: 502-991-1113 | **O**: 502-627-2791 | **F**: 502-267-2550
lge-ku.com

Public

From: Poff, Leslie M (EEC) <LeslieM.Poff@ky.gov>
Sent: Tuesday, August 09, 2022 8:53 AM
To: Pardee, Marlene Zeckner <Marlene.Pardee@lge-ku.com>
Cc: Lewis, Kelly (EEC) <kelly.lewis@ky.gov>; Kennedy, Michael (EEC) <michael.kennedy@ky.gov>
Subject: 1-Hour SO2 Ongoing Data Requirements

Dear Mrs. Pardee,

On April 29, 2016, Kentucky Utilities – Ghent (Ghent) delivered an air dispersion modeling demonstration that revealed modeled SO_2 concentrations below the 1-Hour National Ambient Air Quality Standard (NAAQS) of 75 ppb. This was in response to the EPA's SO_2 Data Requirements Rule (DRR) that was promulgated on August 21, 2015.

The SO_2 Data Requirements Rule Section 51.1205 states that there are ongoing data requirements for sources that chose to demonstrate compliance with the NAAQS through modeling. Section (b) states:

"For any area where modeling of actual SO_2 emissions serve as the basis for designating such area as attainment for the 2010 SO_2 NAAQS, the air agency shall submit an annual report to the EPA Regional Administrator by July 1 of each year, either as a stand-alone document made available for public inspection, or as an appendix to its Annual Monitoring Network Plan (also due on July 1 each year under 40 CFR 58.10), that documents the annual SO_2 emissions of each applicable source in each such area and provides an assessment of the cause of any emissions increase from the previous year. The first report for each such area is due by July 1 of the calendar year after the effective date of the area's initial designation."

The three most recent years of data (2019-2021) show an increase in SO_2 emissions at the Ghent facility.

Source	SO_2 Emissions (tpy)		
	2019	2020	2021
KU - Ghent	8546.38	8,600.66	11,059.99

*Emissions data acquired from Clean Air Markets Division (CAMD)

Since an increase in SO_2 emissions has been recorded, the Kentucky Division for Air Quality is requesting KU to provide an assessment of the cause of the SO_2 emissions increase at Ghent so that we may submit the assessment with the annual report required by the SO_2 DRR.

Please provide the assessment/explanation for the emissions increase **on or before Friday, August 19, 2022**. We are working to get this report drafted and out to public notice before it is finalized and sent to the EPA.

If you have any questions, need more time, or would like to discuss this further, please feel free to contact me.

Thank You,

Leslie Poff
Kentucky Division for Air Quality
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601
Phone: 502-782-6735

Appendix D

Louisville Gas & Electric – Trimble County Response

APPENDIX B

Mr. Cordes,

Louisville Gas & Electric (LG&E) Trimble County Generating Station's variation in SO_2 emissions is largely attributed to an increase in utilization. Due to retirements of units in the LG&E and KU Energy (LKE) fleet, we are shifting our generation to newer units within our fleet. Individual unit utilization varies annually based on electricity usage rates, fuel costs, planned outages, etc. Planned outages for compliance with new or revised regulations requiring installation of new equipment such as emission controls and dry ash handling systems has increased utilization to displace the loss of generation from other units within the fleet during this time period. Trimble County Unit 1 has seen the largest increase in utilization since Trimble County Unit 2 is historically a base load unit.

In addition, the submitted modeling results also included contributions from the LKE Ghent Generating Station. In the time periods specified below, the Ghent SO_2 emissions decreased by 28.8%. Combining emissions from both LKE sources, data shows there is a 19.34% decrease in SO_2 emissions from the LKE sources when comparing the 2012-2014 modeled time period to the 2017-2019 time period. Thus, further validating the modeled results in demonstrating attainment with the 1 hr SO_2 NAAQS.

Source	Modeled Years (tpy)			Subsequent Years (tpy)		
	2012	2013	2014	2017	2018	2019
KU - Ghent	10772.4	13421.9	14851.2	8633.6	10620.9	8544.8

Source	Average 2012-2014 (tpy)	Average 2017-2019 (tpy)	Average Percent Change
KU – Ghent	13015.17	9266.43	-28.80%

Source	Modeled Years (tpy)			Subsequent Years (tpy)		
	2012	2013	2014	2017	2018	2019
Ghent & Trimble	13668.23	16943.29	17907.4	11995.75	14629.25	12511.69

Source	Average 2012-2014 (tpy)	Average 2017-2019 (tpy)	Average Percent Change
Ghent & Trimble	16172.97	13045.56	-19.34%

Brandan Burfict

Appendix E

Tennessee Valley Authority – Shawnee Response

From:	Stanton, Tracy Palmer
To:	Poff, Leslie M (EEC)
Cc:	Lewis, Kelly (EEC); Kennedy, Michael (EEC); Tritapoe, Michael G
Subject:	RE: 1-Hour SO2 Ongoing Data Requirements
Date:	Friday, August 19, 2022 4:26:09 PM
Attachments:	image003.png image004.png

Ms. Poff,

Shawnee Fossil Plant (SHF) saw a significant decrease in operation in 2020 due to less demand for electricity as offices closed and industrial activity slowed sharply with government travel and work restrictions to slow the spread of the coronavirus. This decrease in electricity demand was seen mostly from late March through June of 2020 and was atypical operation for SHF. As government COVID restrictions eased, electricity demand rose back to pre-pandemic levels in 2021 and emissions for SO_2 at SHF increased over those in 2020 as a result.

Please let me know if you need any additional information.

Thank you!

Tracy P. Stanton
Air Specialist IV
Air Permits, Compliance and Monitoring

TVA logo

W. 865-632-3080 **M.** 865-209-6940 **E.** tpstanton@tva.gov
400 West Summit Hill Drive, Knoxville, TN 37902

From: Poff, Leslie M (EEC) <LeslieM.Poff@ky.gov>
Sent: Tuesday, August 09, 2022 8:53 AM
To: Stanton, Tracy Palmer <tpstanton@tva.gov>
Cc: Lewis, Kelly (EEC) <kelly.lewis@ky.gov>; Kennedy, Michael (EEC) <michael.kennedy@ky.gov>
Subject: 1-Hour SO2 Ongoing Data Requirements

Dear Mrs. Stanton,

On July 7, 2016, Tennessee Valley Authority - Shawnee (Shawnee) delivered an air dispersion modeling demonstration that revealed modeled SO_2 concentrations below the 1-Hour National Ambient Air Quality Standard (NAAQS) of 75 ppb. This was in response to the EPA's SO_2 Data Requirements Rule (DRR) that was promulgated on August 21, 2015.

The SO_2 Data Requirements Rule Section 51.1205 states that there are ongoing data requirements for sources that chose to demonstrate compliance with the NAAQS through modeling. Section (b) states:

"For any area where modeling of actual SO_2 emissions serve as the basis for designating such area as attainment for the 2010 SO_2 NAAQS, the air agency shall submit an annual report to the EPA Regional Administrator by July 1 of each year, either as a stand-alone document made available for public inspection, or as an appendix to its Annual Monitoring Network Plan (also due on July 1 each year under 40 CFR 58.10), that documents the annual SO_2 emissions of each applicable source in each such area and provides an assessment of the cause of any emissions increase from the previous year. The first report for each such area is due by July 1 of the calendar year after the effective date of the area's initial designation."

The three most recent years of data (2019-2021) show an increase in SO_2 emissions between 2020 and 2021.

Source	SO_2 Emissions (tpy)		
	2019	2020	2021
TVA - Shawnee	16,345.72	9,024.44	14,696.44

*Emissions data acquired from Clean Air Markets Division (CAMD)

Since an increase in SO_2 emissions has been recorded, the Kentucky Division for Air Quality is requesting TVA to provide an assessment of the cause of the SO_2 emissions increase at Shawnee so that we may submit the assessment with the annual report required by the SO_2 DRR.

Please provide the assessment/explanation for the emissions increase **on or before Friday, August 19, 2022**. We are working to get this report drafted and out to public notice before it is finalized and sent to the EPA.

If you have any questions, need more time, or would like to discuss this further, please feel free to contact me.

Thank You,

Leslie Poff
Kentucky Division for Air Quality
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601
Phone: 502-782-6735

Appendix F

Public Notice

KENTUCKY DIVISION FOR AIR QUALITY
PUBLIC NOTICE FOR
THE SULFUR DIOXIDE DATA REQUIREMENTS RULE 2022 ANNUAL REPORT

The Kentucky Energy and Environment Cabinet (Cabinet) is proposing this annual report for the Sulfur Dioxide (SO_2) Data Requirements Rule (DRR) for the 2010 1-Hour SO_2 National Ambient Air Quality Standards (NAAQS). The United States Environmental Protection Agency (EPA) established this rule for air agencies to annually characterize current air quality in areas with large sources of SO_2 emissions.

In accordance with 40 CFR 51.102, the Cabinet is making this proposed plan available for public inspection and provides the opportunity for public comment. The proposed plan can be found at **https://eec.ky.gov/Environmental-Protection/Air/Pages/Public-Notices.aspx.** The public comment period will be open from October 5, 2022 through November 4, 2022. Comments should be submitted in writing to the contact person by either mail or email.

CONTACT PERSON: Leslie Poff, Environmental Scientist Consultant, Program Planning & Administrative Branch, Division for Air Quality, 300 Sower Boulevard, Frankfort, Kentucky 40601. Phone: (502) 782-6735; Email: lesliem.poff@ky.gov.