

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

**ELECTRONIC 2023 INTEGRATED RESOURCE) CASE NO.
PLAN OF BIG RIVERS ELECTRIC CORPORATION) 2023-00310**

**BIG RIVERS ELECTRIC CORPORATION'S
RESPONSES TO KENTUCKIANS FOR THE COMMONWEALTH AND
KENTUCKY RESOURCE COUNCIL'S
FIRST REQUEST FOR INFORMATION**

Big Rivers Electric Corporation (“Big Rivers” or the “Company”) by counsel, files its responses to Kentuckians for the Commonwealth (“KFTC”) and Kentucky Resource Council’s (“KRC”) (collectively, “Joint Intervenors” or “JI”) First Request for Information, issued in the above-captioned case on December 8, 2023.

FILED: January 5, 2024

IN THE MATTER OF:
ELECTRONIC 2023 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2023-00310

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REQUEST NO. 1-1: *With regards to each modeling run carried out as part of this IRP,*

including Appendices:

- a. Produce all modeling input and output files (in electronic machine readable, unprotected format with original formulas intact) for each run.*
- b. Produce any workbooks or workpapers, in electronic, machine readable, unprotected format with original formulas intact, used to develop or process inputs to the model.*
- c. Produce any workbooks or workpapers, in electronic, machine readable, unprotected format with original formulas intact, used to review or process outputs of each model run.*

RESPONSE: Big Rivers objects to this request as overly broad and unduly burdensome. Subject to and without waiving the foregoing, Big Rivers states that the CONFIDENTIAL responsive files are provided with this response, subject to a motion for confidential treatment.

Witness: John Christensen (1898 & Co.)

For the Objection(s): Counsel

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REQUEST NO. 1-2: *For each monthly billing period in calendar years 2021 and 2022, as well as the first and second quarters of 2023, please provide the following information for residential class customers:*

- a. Service charge (per month)*
- b. Energy charge (per kWh)*
- c. FAC factor (per kWh)*
- d. Actual average monthly usage (kWh)*

RESPONSE: As a Generation and Transmission Cooperative, Big Rivers does not have a residential class of customers. Parts a., b. and d. are not applicable.

- c. The FAC factors (per kWh) are provided below.

<u>Jan-21</u>	<u>\$(0.00053)</u>	<u>Nov-21</u>	<u>\$0.00611</u>	<u>Sep-22</u>	<u>\$0.02887</u>
<u>Feb-21</u>	<u>\$(0.00689)</u>	<u>Dec-21</u>	<u>\$0.00954</u>	<u>Oct-22</u>	<u>\$0.02350</u>
<u>Mar-21</u>	<u>\$(0.00107)</u>	<u>Jan-22</u>	<u>\$0.01162</u>	<u>Nov-22</u>	<u>\$0.02003</u>
<u>Apr-21</u>	<u>\$(0.00212)</u>	<u>Feb-22</u>	<u>\$0.01917</u>	<u>Dec-22</u>	<u>\$0.01449</u>
<u>May-21</u>	<u>\$(0.00305)</u>	<u>Mar-22</u>	<u>\$0.01523</u>	<u>Jan-23</u>	<u>\$0.00783</u>
<u>Jun-21</u>	<u>\$(0.00042)</u>	<u>Apr-22</u>	<u>\$0.01807</u>	<u>Feb-23</u>	<u>\$0.00133</u>
<u>Jul-21</u>	<u>\$(0.00059)</u>	<u>May-22</u>	<u>\$0.00619</u>	<u>Mar-23</u>	<u>\$0.00397</u>
<u>Aug-21</u>	<u>\$(0.00091)</u>	<u>Jun-22</u>	<u>\$0.02047</u>	<u>Apr-23</u>	<u>\$0.00507</u>
<u>Sep-21</u>	<u>\$(0.00063)</u>	<u>Jul-22</u>	<u>\$0.02222</u>	<u>May-23</u>	<u>\$0.00611</u>
<u>Oct-21</u>	<u>\$ 0.00643</u>	<u>Aug-22</u>	<u>\$0.03466</u>	<u>Jun-23</u>	<u>\$0.00902</u>

Witness: Christopher A. "Chris" Warren

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REQUEST NO. 1-3: *Refer to page 7 of the IRP. With regards to the statement that the IRP “reflects the continuing, in-depth analysis required to ensure future demand is met with a reliable supply of affordable electricity”:*

- a. *Identify and produce any analysis of the average energy burden (i.e. percent of household income that goes towards utility bills) that Big Rivers residential customers currently experience or would experience as a result of the resource decisions proposed in this IRP.*
- b. *State whether reducing energy burdens for low-income customers was considered as part of this IRP process. If so, explain how. If not, explain why not.*
- c. *Identify the following data for each monthly of 2022:*
 - i. *Number of customers who were sent a notice of potential disconnection of electric service due to non-payment.*
 - ii. *Number of customers who had their electric service disconnected due to non-payment.*
 - iii. *Number of customers with past due electric bills, and the average amount owed on such past due bills.*
 - iv. *Total arrearages for all Big Rivers customers.*
 - v. *Total late payment fees charged to Big Rivers customers.*

RESPONSE:

- a. Big Rivers has not studied the current or future average energy burden resulting from the proposed resources in the IRP.

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- b. The IRP analysis considers resource decisions that optimize cost for all retail members, including low-income members.
- c. Big Rivers is a Generation and Transmission (G&T) utility, which is owned by three distribution cooperatives. Big Rivers provides wholesale electric service to its customers and in the wholesale market. Big Rivers does not provide retail electric service.

Witness: Nathaniel A. Berry

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REQUEST NO. 1-4: *Refer to pages 24-25 and Table 2.2.7(a) of the IRP. With regards*

to the RFIs for economic development projects discussed therein:

- a. Identify the same data provided in Table 2.2.7(a) for each of the years 2015- 2019.*
- b. Identify how many of the economic development projects that submitted RFIs in any of the years 2015 through 2023 have actually been implemented in the Big Rivers territory, and the total MW of the projects that have been implemented.*
- c. Produce any forecast or projection of the number and total MW of economic development projects that will be implemented in the Big Rivers territory in any of the years 2024 through 2042.*

RESPONSE:

- a. The requested information for 2015 is unavailable.

	2016	2017	2018	2019
RFI's	4	21	24	10
Capital Investment	\$25 M	\$230 M	\$300 M	\$1.3 B
Jobs	730	3,374	1,700	2,545
MW's	896	3,089	1,713	676

- b. Three economic development projects were implemented, totaling 264 MW.

c. Economic Development activity within Big Rivers' territory remains strong. That said, Big Rivers does not prepare independent forecasts or projections with respect to economic development projects, but that activity is reflected in its load forecasts.

Witness: Nathaniel A. Berry

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REQUEST NO. 1-5: *Refer to page 30 of the IRP. With regards to the minimum
generation limits for Big Rivers' generating units:*

- a. Identify the current limit for each unit.*
- b. Identify the historical limit for each unit.*
- c. Identify when Big Rivers "significantly lower[ed] the historical minimum
generation limit" on each unit.*

RESPONSE:

- a. Green 1 – 66 MW net
Green 2 – 66 MW net
Reid CT – 20 MW net
Wilson – 150 MW net
- b. Green 1 – 162 MW net
Green 2 – 161 MW net
Reid CT – 20 MW net
Wilson – 300 MW net
- c. Green 1 – July 2, 2022
Green 2 – July 23, 2022
Reid CT – no change
Wilson – May 9, 2020

Witness: Nathaniel A. Berry

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REQUEST NO. 1-6: *Refer to page 33 of the IRP. With regards to Big Rivers' generation*

performance:

- a. Confirm that the capacity of the Wilson plant was derated more than 200 MW from December 19, 2022 through Jan. 2, 2023, including during Winter Storm Elliot.*
- b. Confirm that the Wilson plant was tripped offline for 2.6 hours during Winter Storm Elliot due to wet/frozen coal issues.*
- c. Confirm that the Reid CT unit experienced two starting failures for a total of 8 hours during Winter Storm Elliot.*
- d. Identify by day and hour(s) each time since January 1, 2018 that Green Units 1 and/or 2 were on forced outage, unavailable, or derated due to inadequate fuel supply.*
- e. Identify by day and hour(s) each time since January 1, 2018 that the Reid CT unit was on forced outage, unavailable, or derated due to inadequate fuel supply.*

RESPONSE:

- a. Confirmed.
- b. Confirmed.
- c. Confirmed.

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d. & e. Texas Gas Transmission performed maintenance on their system that prevented Big Rivers from receiving gas during the below dates and times:

Reid CT – 10/1/2023 08:00 – 10/5/2023 15:50

Green 1 – 10/1/2023 08:00 – 10/5/2023 15:50

Green 2 - 10/1/2023 08:00 – 10/5/2023 15:50

Witness: Nathaniel A. Berry

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REQUEST NO. 1-7: *Refer to Table 2.3(b) on page 34 of the IRP.*

- a. Identify the net capacity factor for each of the years 2018 through 2022 for each of the Wilson, Green, and Reid units.*
- b. Identify the net output factor for each of the years 2018 through 2022 for each of the Wilson, Green, and Reid units.*

RESPONSE:

- a. Please see the below table:

NCF (%)	2018	2019	2020	2021	2022
Wilson	61.77	72.26	63.24	83.59	65.39
Green 1	72.93	62.07	36.04	65.48	24.33
Green 2	81.05	55.55	20.11	54.38	14.31
Reid CT	0.46	0.72	0.26	0.44	0.12

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b. Please see the below table:

NOF (%)	2018	2019	2020	2021	2022
Wilson	91.14	85.46	77.85	92.54	89.2
Green 1	82.69	78.83	59.22	86.48	63.35
Green 2	83.90	76.51	60.97	83.90	56.40
Reid CT	31.64	32.73	24.98	23.42	28.68

Witness: Nathaniel A. Berry

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REQUEST NO. 1-8: *Refer to page 35 of the IRP. For each of the Wilson, Green, and*

Reid generating units (or by plant if Big Rivers does not maintain unit-level data):

- a. Explain the basis for the “expected retirement date” of each of the units identified therein, and produce any analysis, modeling input and output files, workpapers, or other documents supporting such dates.*
- b. Produce any profit and loss statement, revenue projection, net present value (“NPV”) revenue requirement, or other economic analysis of the unit completed since 2018, including any modeling input and output files, workpapers, or other documents used in carrying out such analysis.*
- c. Produce the most recent condition assessment for each unit.*
- d. Produce any analysis or assessment of the impact that retirement of each unit would have on resource adequacy, transmission grid stability, transmission grid support, voltage support, or transmission system reliability.*
- e. Identify any transmission grid upgrades or changes that would be needed to allow for the retirement of any of the units.*

RESPONSE: Big Rivers objects that this request is overly broad, unduly burdensome, and not reasonably calculated to lead to the discovery of admissible evidence. Without waiving these objections, Big Rivers states as follows.

- a. Big Rivers strives to strike the appropriate balance for its Member-Owners to provide safe, reliable power, at the lowest reasonable cost, taking into account the risk of

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intermittent resources, and regulatory risk of relying too heavily on coal-fired generation.¹ Big Rivers' decisions to keep or add a generating resource are supported by multiple factors. For example, Big Rivers' planning objectives guiding its 2023 IRP process include:

- Maintaining a current and reliable load forecast;
- Providing competitively-priced power to its Member-Owners;
- Maximizing reliability while ensuring safety, minimizing costs, risk, and environmental impacts;
- Identifying potential new supply-side resources;
- Maintaining adequate planning reserve margins;
- Developing and maintaining a more diversified supply portfolio aligned with anticipated Member-Owner Load; and
- Meeting North American Electric Reliability Corporation ("NERC") guidelines and requirements.²

Related to the retirement of the Wilson Station, Big Rivers continues to believe that there remains value in retaining its most efficient baseload resource.³ Further, Wilson Station running on coal throughout the entire study period is supported by the modeling results in the 2023 IRP analysis.

¹ *In the Matter of: Big Rivers 2020 IRP*, Case No. 2020-00299, Big Rivers Electric Corporation's Response to the Staff's Report and Post-Hearing Comments (Feb. 11, 2022).

² *See* 2023 IRP at p. 37.

³ *In the Matter of: Big Rivers 2020 IRP*, Case No. 2020-00299, Big Rivers Electric Corporation's Response to the Office of the Attorney Generals First Request for Information at AG 1-19 and AG 1-23 (Mar. 19, 2021).

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Related to the two Green Station generating units, Big Rivers has previously and thoroughly discussed its basis for the Green units retiring in 2029, or as soon as the NGCC comes online.⁴ Additionally, the modeling results in the 2023 IRP analysis support this plan.

Related to the Reid Combustion Turbine (Reid CT), assuming the Reid CT continues to operate nominally as it has for over forty years, and assuming that parts are available for continued maintenance, an expected life span of sixty (60) years should be achievable.⁵ The IRP analysis supports keeping the Reid CT as a natural gas peaking unit.

b. Please see the 2023 IRP, which includes significant analysis surrounding the optimum use of Big Rivers' existing assets.

c. There is no recent formal "condition assessment for each unit," but please see the attached CONFIDENTIAL documentation, which is being produced subject to a motion for confidential treatment.

⁴ *In the Matter of: Big Rivers 2020 IRP*, Case No. 2020-00299, Big Rivers Electric Corporation's Responses to the Commission Staff's First and Second Requests for Information at PSC 1-26 and PSC 2-19 (Mar. 19, 2021) (May 11, 2021); See also, *In the Matter of: Electronic Application of Big Rivers Electric Corporation for a Certificate of Public Convenience and Necessity Authorizing the Conversion of the Green Station Units to Natural Gas-Fired Units and an Order Approving the Establishment of a Regulatory Asset*, Case No. 2021-00079, Order (Jun. 11, 2021)

⁵ *In the Matter of: Big Rivers 2020 IRP*, Case No. 2020-00299, Big Rivers Electric Corporation's Response to the Office of the Attorney Generals First Request for Information at AG 1-4(c) (Mar. 19, 2021).

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d. Please see the 2023 IRP, which contains significant analysis or assessment related to resource adequacy. To date, no formal transmission analyses have been completed. Prior to retirement of these generating units, MISO will perform analysis through the Attachment Y process. Additional details can be found in Section 382.7 of the MISO Tariff.

e. At this time, no such transmission grid upgrades or changes have been identified. Prior to the retirement of these generating units, MISO will perform analyses through the Attachment Y process. Additional details can be found in Section 38.2.7 of the MISO Tariff.

Witnesses: Nathaniel A. Berry (subparts a, c, and d)
Christopher A. Warren (for subpart b)
Christopher S. Bradley (subparts d and e)

For the Objection(s): Counsel

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REQUEST NO. 1-9: *Refer to page 36 of the IRP.*

- a. Produce the 2022 All Source Request for Proposals ("RFP") for generation resources.*
- b. Explain why Big Rivers issued an RFP for generation resources in 2022.*
- c. Produce all of the bids received in response to the 2022 RFP.*
- d. Produce any summary, analysis, or report regarding the bids received in response to the 2022 RFP.*

RESPONSE:

- a. See the attached All-Source Request for Proposals.
- b. Big Rivers chose to issue an All-Source RFP for generation resources in 2022 in order to facilitate entry into the MISO Generation Interconnection queue for 2022. This timing was necessary in order to accommodate the June 2029 service date.
- c. Big Rivers objects to this request as overly burdensome and not reasonably tailored to lead to relevant or admissible evidence.
- d. Big Rivers objects to this request as overly burdensome and not reasonably tailored to lead to relevant or admissible evidence.

Witness: Nathaniel A. Berry

For the Objection(s): Counsel

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REQUEST NO. 1-10: *For each of Wilson, Green, and Reid generating units,
provide the following historical annual data by unit, or, if Big Rivers does not maintain unit-
level data, by plant, from 2018 to present:*

- a. Fixed O&M cost*
- b. Non-fuel variable O&M cost*
- c. Fuel costs*
- d. Capital costs*
- e. Heat rate*
- f. Generation*
- g. Capacity rating*
- h. Capacity factor*
- i. Forced outage rate*
- j. Planned outage rate*
- k. Energy revenues*
- l. Capacity revenues*
- m. Ancillary services revenues.*
- n. Unforced capacity ("UCAP")*

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RESPONSE: Please see the CONFIDENTIAL attachment to this response, provided
subject to a motion for confidential treatment.

Witness: Nathaniel A. Berry

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REQUEST NO. 1-11: *For each of the Wilson, Green, and Reid generating units, provide the following projected annual data by unit, or, if Big Rivers does not maintain unit-level data, by plant, for the years 2023 through 2037:*

- a. Fixed O&M cost*
- b. Non-fuel variable O&M cost*
- c. Fuel costs*
- d. Capital costs*
- e. Heat rate*
- f. Generation*
- g. Capacity rating*
- h. Capacity factor*
- i. Forced outage rate*
- j. Planned outage rate*
- k. Energy revenues*
- l. Capacity revenues*
- m. Ancillary services revenues*
- n. Unforced capacity ("UCAP")*

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RESPONSE: Please see the CONFIDENTIAL attachment to this response, provided
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Witness: Christopher A. "Chris" Warren

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REQUEST NO. 1-12: *Refer to page 56 of the IRP. With regards to the Powering*

Affordable Clean Energy ("PACE") program:

- a. Identify and produce any analysis or evaluation that you carried out or reviewed of potential funding opportunities under the PACE program.*
- b. Produce the referenced Letter of Interest and any supporting materials that Big Rivers submitted to the Rural Utilities Service ("RUS").*
- c. Explain why Big Rivers decided to include only the two referenced projects in its Letter of Interest, as opposed to additional and/or larger projects. Produce any supporting documentation for that decision.*
- d. State whether Big Rivers has been invited to submit a full application under the PACE program.*
 - i. If so, produce the invitation and any application that Big Rivers has submitted. If Big Rivers has not yet submitted the application, state by when it plans to do so.*
 - ii. If not, state whether Big Rivers has been informed that it will not be invited to submit an application, or whether Big Rivers is still waiting for a response to its Letter of Interest.*
- e. State whether Big Rivers would still proceed with the two projects proposed in the Letter of Interest if it does not receive PACE support for those projects. If not, explain why not.*

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RESPONSE:

- a. Big Rivers has no additional analysis to produce.
- b. Please see a copy of the CONFIDENTIAL LOI provided with this response.
- c. The two projects included in the Letter of Interest (LOI) meet the program requirements and fit within Big Rivers' portfolio.
- d. On December 6, 2023, Big Rivers received an invitation to apply under the PACE program for the McCracken Solar & Battery project.
 - i. Big Rivers' application currently is being developed, and Big Rivers anticipates submitting it mid-first quarter of 2024.
 - ii. Not applicable.
- e. Big Rivers will proceed with the Unbridled Solar Power Purchase Agreement. Big Rivers would have to reevaluate the business case for the McCracken solar project if it does not receive program funding as described in the LOI.

Witness: Erin M. Murphy

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REQUEST NO. 1-13: *Refer to pages 56-57 of the IRP. With regards to the*

Empowering Rural America (“NewERA”) program:

- a. *Identify and produce any analysis or evaluation that you carried out or reviewed of potential funding opportunities under the NewERA program.*
- b. *Describe the “project that will significantly reduce carbon emissions,” including what types of resources would be involved in the project, the estimated amount by which the project would reduce carbon emissions, the estimated cost of the project, the amount of NewERA funding Big Rivers is seeking for the project, and the anticipated timing of the project.*
- c. *Produce the referenced Letter of Interest and any supporting materials that Big Rivers submitted to the Rural Utilities Service (“RUS”).*
- d. *State whether Big Rivers has been invited to submit a full application under the NewERA program.*
 - i. *If so, produce the invitation and any application that Big Rivers has submitted. If Big Rivers has not yet submitted the application, state by when it plans to do so.*
 - ii. *If not, state whether Big Rivers has been informed that it will not be invited to submit an application, or whether Big Rivers is still waiting for a response to its Letter of Interest.*
- e. *State whether Big Rivers would still proceed with the project proposed in the Letter of Interest if it does not receive NewERA support for those projects. If not, explain why not.*

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RESPONSE:

- a. Big Rivers has no additional analysis to produce.
- b. On September 15, 2023, Big Rivers submitted a Letter of Interest (LOI) for funding via The Empowering Rural America (New ERA) program to support installation of a carbon capture and sequestration project at its D.B. Wilson Generating Station. The US Department of Agriculture's Achievable Reductions Tool (ART) estimates that installation of carbon capture technology on this generating resource would reduce greenhouse gas emissions by 47.9% annually and decrease carbon intensity by 52.6% annually. Big Rivers estimates the project cost to be \$2.5 billion and has requested the maximum available funding from the New ERA program: 25% grant and a 0% interest loan to finance the remainder of the project. In addition to New ERA program funding, Big Rivers also anticipates using the 45Q tax credits to offset costs of the project. Under Big Rivers' analysis, even in the most conservative case, the loan amount for the project would be offset by the 45Q tax credits over the life of the project. Based on the award and program timeline, Big Rivers anticipates the project could be completed by the end of calendar year 2030.
- c. Please see a copy of the CONFIDENTIAL Letter of Intent provided with this response.

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d. Big Rivers has not yet been invited to submit a full application under the NewERA program.

i. Not applicable.

ii. Big Rivers has not been informed that it will not be invited to submit a full application.

e. The economics of carbon capture have improved significantly because of the Inflation Reduction Act (IRA) and the Infrastructure, Investment and Jobs Act (IIJA).¹ IRA provides \$85/ton for CO₂ captured and stored in saline formations, and IIJA supports CO₂ pipeline and storage site development. Without these sources of funding, it is unlikely a carbon capture and sequestration project at D.B. Wilson would be economic for Big Rivers.

Witness: Erin M. Murphy

¹ <https://www.regulations.gov/document/EPA-HQ-OAR-2023-0072-0061>

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REQUEST NO. 1-14: *Has Big Rivers sought any financing for potential clean energy projects from the U.S. Department of Energy's Energy Infrastructure Reinvestment (EIR) program?*

- a. If so, identify the potential clean energy projects for which financing has been sought, and produce any Letter of Interest, application, or other documentation of such proposal.*
- b. If not, explain why not.*

RESPONSE: Big Rivers has not sought financing from the U.S. Department of Energy's Energy Infrastructure Reinvestment program. Big Rivers has prioritized potential grant and low-interest loan opportunities managed through the PACE and New ERA programs, while continually reviewing other program opportunities for likelihood of success and impact to Big Rivers' strategic plan.

Witness: Erin M. Murphy

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REQUEST NO. 1-15: *Has Big Rivers sought any financing or funding for potential clean energy projects from the U.S. Department of Agriculture's Rural Energy for America Program?*

- a. If so, identify the potential clean energy projects for which financing has been sought, and produce any Letter of Interest, application, or other documentation of such proposal.*
- b. If not, explain why not.*

RESPONSE: Big Rivers has not sought financing from the U.S. Department of Agriculture's Rural Energy for America Program. Big Rivers has prioritized potential grant and low-interest loan opportunities managed through the PACE and New ERA programs, while continually reviewing other program opportunities for likelihood of success and impact to Big Rivers' strategic plan.

Witness: Erin M. Murphy

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REQUEST NO. 1-16: *Did Big Rivers' IRP process consider the availability of the Low-Income Communities Bonus Credit Program for solar and wind facilities located in low-income communities or developed as part of a qualified low-income residential building or economic benefit project. If so, how was that program considered? If not, explain why not.*

RESPONSE: Big Rivers has not considered the availability of the Low-Income Communities Bonus Credit Program. Big Rivers has prioritized potential grant and low-interest loan opportunities managed through the PACE and New ERA programs, while continually reviewing other program opportunities for likelihood of success and impact to Big Rivers' strategic plan.

Witness: Erin M. Murphy

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REQUEST NO. 1-17: *Refer to pages A-17 to A-18 of Appendix A to the IRP. With*

regards to the electric vehicle ("EV") forecast set forth therein:

- a. *Identify and produce the EIA Annual Energy Outlook regional projections from which the forecasted annual EV energy charging values are derived.*
- b. *Explain how the forecasted annual EV energy charging values were derived from the EIA Annual Energy Outlook regional projections, including any changes you made to the assumptions or results of the EIA projections.*
- c. *State whether any Inflation Reduction Act tax incentives were factored into the EV forecast. If so, explain how. If not, explain why not.*
- d. *State whether Big Rivers has evaluated incentive programs, creation of a public charging network, or other steps it could take to increase the adoption of electric vehicles in its territory.*
 - i. *If so, explain the results of such evaluation and produce any documentation of the same.*
 - ii. *If not, explain why not.*

RESPONSE:

- a. The regional table used is Table 38 of the Annual Energy Outlook for region "East South Central". This table is provided with this response as attachment "AEO_Table_38."
- b. The regional table provided in subpart a. contains the number of EVs sold each year. This table is combined with annual EV retirement percentages and energy-per-EV values

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from other national Annual Energy Outlook tables to arrive at a final annual charging energy figure.

c. The Inflation Reduction Act was not factored into the EV forecast. Clearspring uses the EIA Annual Energy Outlook from 2022 (AEO2022) for the projections. The AEO2022 only uses current laws and regulations as of November 2021 in the AEO2022, and the Inflation Reduction Act was signed into law after this date.

d. Big Rivers has worked with KYDOT and other utilities on the identification and selection of sites for public charging for the past several years. Big Rivers has remained engaged in the process as the National Electric Vehicle Infrastructure rollout proceeds. In December 2023, Big Rivers contracted with Sagewell, Inc., to conduct AMI analysis for Member-Owners in order to identify EV load saturation and trends. These results will serve as the basis for potential EV rate programs moving forward.

i. Results of the AMI analysis are not yet available.

ii. Not applicable.

Witnesses: Matt Sekeres and Steve Fenrick (Clearspring) (subparts a,b,c)

Russell L. Pogue (subpart d)

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REQUEST NO. 1-18: *Refer to pages A-19 to A-20 of Appendix A to the IRP. With*

regards to the distributed generation (“DG”) forecast set forth therein:

- a. Identify and produce the specific portions of the EIA Annual Energy Outlook from which the forecasted annual DG amounts are derived.*
- b. Explain how the forecasted annual DG amounts were derived from the EIA Annual Energy Outlook, including any changes you made to the assumptions or results of the EIA forecast.*
- c. State whether any Inflation Reduction Act tax incentives were factored into the DG forecast. If so, explain how. If not, explain why not.*
- d. For each of the years 2018 through 2023, provide the following information for the Big Rivers rural system in total and for each of Big Rivers' member distribution companies. Provide data for all customer classes, DG technologies, and tariffs used (e.g. Net metering, SQF, LQF, etc.):*
 - i. the total number of DG customers.*
 - ii. The total capacity (KW) of DG.*
 - iii. The total energy (kwh) exported to Big Rivers by DG customers.*
- e. For each of the years 2023 through 2042, and for each of residential and commercial customers, identify the forecasted number and capacity (KW) of DG customers in the Big Rivers rural system, and explain the basis for that forecast.*
- f. State whether Big Rivers has evaluated any programs or other steps it could take to increase the number of DG customers in its rural system.*
 - i. If so, explain the results of such evaluation and produce any documentation of the same.*
 - ii. If not, explain why not.*

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- g. Has Big Rivers prepared or reviewed any analysis of the potential grid resilience and reliability benefits of distributed solar generation in its territory? If so, produce that analysis. If not, explain why not.*
- h. Kenergy's Solar Net Metering and Alternative Energy webpage states that "Many of Kenergy's substations are becoming saturated with solar energy production and reaching their capacity limit."*
- i. Explain the basis for this claim, and produce any analysis and data showing that many of Kenergy's substations are reaching their capacity limits, and that they are doing so because of solar energy production.*
- ii. State whether the capacity limits referenced here are the substations' rated capacity or some lower limit established by Kenergy and/or Big Rivers. If it is a lower limit, identify what percent of the rate capacity the limit is set at, and explain the reason for applying such lower limit.*
- iii. State whether Big Rivers is taking any steps to address the capacity limit issue to ensure that it does not restrict solar net metering growth. If so, explain what steps are being taken. If not, explain why not.*

RESPONSE:

- a. Attachments include AEO Table 21 "Residential Sector Equipment Stock and Efficiency, and Distributed Generation" (file name "AEO_Table_21") and AEO Table 22 "Commercial Sector Energy Consumption, Floorspace, Equipment Efficiency, and Distributed Generation" (file name "AEO_Table_22"). Areas of particular interest include AEO Table 21 row 83, and AEO Table 22 row 68.

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b. Year-over-year growth rates from the EIA tables are applied to the latest historical capacities at each distribution Member-Owner. Then the data is run through the National Renewable Energy Laboratory (NREL) PVWatts Calculator (<https://pvwatts.nrel.gov/index.php>) and matched with system peak times to obtain monthly energy and peak contributions.

c. Please see the response to Kentuckians for the Commonwealth/Kentucky Resource Council's Request No. 1-17, subpart c.

d. Please see the table below. Please note that the provided figures reflect existing data collection by Big Rivers, which differentiates net metered accounts and non-net metered accounts.

i. See below.

ii. See below.

iii. See below.

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Energy (kwh) exported to Big Rivers by DG customers	
Year	kWh
2018	42,546.00
2019	86,862.00
2020	86,317.00
2021	176,773.00
2022	822,116.02
2023	778,383.00

e. DG customer counts are not directly forecasted. The capacities for each class and distribution Member-Owners are provided below. The basis for the forecast is explained above in subparts a. and b.

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DG Capacity (kW)						
Year	JPEC Residential	JPEC Commercial	Kenergy Residential	Kenergy Commercial	MCRECC Residential	MCRECC Commercial
2023	589	427	4,188	3,038	926	672
2024	635	474	4,512	3,370	997	745
2025	680	506	4,834	3,600	1,069	796
2026	727	543	5,165	3,859	1,142	853
2027	775	573	5,509	4,077	1,218	901
2028	825	596	5,863	4,238	1,296	937
2029	876	625	6,230	4,446	1,377	983
2030	929	644	6,603	4,576	1,460	1,012
2031	985	672	7,000	4,775	1,548	1,056
2032	1,042	691	7,408	4,913	1,638	1,086
2033	1,105	718	7,855	5,108	1,737	1,129
2034	1,172	742	8,335	5,278	1,843	1,167
2035	1,241	753	8,823	5,353	1,951	1,183
2036	1,313	781	9,334	5,550	2,064	1,227
2037	1,388	808	9,870	5,745	2,182	1,270
2038	1,465	833	10,414	5,924	2,302	1,310
2039	1,548	871	11,003	6,192	2,433	1,369
2040	1,635	906	11,621	6,442	2,569	1,424
2041	1,724	935	12,254	6,646	2,709	1,469
2042	1,820	969	12,940	6,888	2,861	1,523

f. Big Rivers has not specifically evaluated programs to increase DG development in rural areas. Growth in DG interconnection has been strong and consistent in the area.

g. Big Rivers is not aware of any such specific analysis.

h. Big Rivers objects to this request as it seeks information regarding Kenergy’s distribution system; moreover, Big Rivers objects that Kenergy is a distinct legal entity that is not a party to this proceeding and speaks for itself.

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Witnesses: Matt Sekeres and Steve Fenrick (Clearspring) (for parts a, b, c, e)
Russell L. Pogue (for parts d, f, g)

For the Objection(s): Counsel

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REQUEST NO. 1-19: *Refer to page A-32 of Appendix A to the IRP. With regards*

to the Large C&I Class projections:

- a. Identify the three new consumers projected to be added in 2024 and the projected energy sales to each.*
- b. Explain why your 2023 Load Forecast shows no changes to the number of consumers, use per consumer, or energy sales in the Large C&I Class from 2029 through 2042.*
- c. Has Big Rivers created or reviewed any forecast of the number of consumers, use per consumer, or energy sales in the Large C&I Class for any of the years 2029 through 2042?*
 - i. If so, identify and produce such forecast, including any workpapers, modeling input and output files, and other documents supporting such forecast.*
 - ii. If not, explain why not.*

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RESPONSE:

a.

Year	[REDACTED]		
	(MWh)	(MWh)	(MWh)
2023	0	0	0
2024	1,188	19,710	7,884
2025	1,188	19,710	7,884
2026	1,188	19,710	7,884
2027	1,188	19,710	7,884
2028	1,188	19,710	7,884
2029	1,188	19,710	7,884
2030	1,188	19,710	7,884
2031	1,188	19,710	7,884
2032	1,188	19,710	7,884
2033	1,188	19,710	7,884
2034	1,188	19,710	7,884
2035	1,188	19,710	7,884
2036	1,188	19,710	7,884
2037	1,188	19,710	7,884
2038	1,188	19,710	7,884
2039	1,188	19,710	7,884
2040	1,188	19,710	7,884
2041	1,188	19,710	7,884
2042	1,188	19,710	7,884

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b. The load forecast incorporates expected changes based on knowledge of those changes through 2028. It is Clearspring's view that the best forecast for the 2029 through 2042 period is to hold the 2028 forecast values steady. This is essentially because the Large C&I class contains a small number of customers that are far less likely to have their operations influenced by regional demographic, economic, and climate conditions relative to the rate classes that are econometrically modeled. The economics of each specific customers' operations within the Large C&I class will tend to have, by far, the largest influence over future growth or reductions within this class.

c. See response to b., above. Big Rivers has not created or reviewed a separate forecast for the Large C&I class for years 2029-2042.

i. Not applicable.

ii. See response to b., above.

Witnesses: Matt Sekeres and Steve Fenrick (Clearspring) (for subparts a and b)

Terry Wright, Jr. (Big Rivers) (for subpart c)

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REQUEST NO. 1-20: *Refer to pages A-33 and A-34 of Appendix A to the IRP.*

With regards to Direct Serve Class projections:

- a. *Identify the one new consumer that you expected to add to the Direct Serve Class in each of 2023 and 2024.*
- b. *Explain why, starting in 2028 and then every fourth year thereafter, the use per consumer and energy sales for the Direct Serve Class increases 0.12% and then declines by 0.12% the very next year.*
- c. *Explain why your 2023 Load Forecast shows no changes to the number of consumers or, with the exception of the 0.12% issue referenced in subpart b, to the use per consumer and energy sales for the Direct Serve Class from 2025 through 2042.*
- d. *Has Big Rivers created or reviewed any forecast of the number of consumers, use per consumer, or energy sales in the Direct Serve Class for any of the years 2025 through 2042?*
 - i. *If so, identify and produce such forecast, including any workpapers, modeling input and output files, and other documents supporting such forecast.*
 - ii. *If not, explain why not.*

RESPONSE:

- a. The table on page A-34 is an annual table that displays an average consumer count across all twelve (12) months. While the annual rounded consumer counts increase by one in 2023

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and 2024, this is the result of a 4th quarter 2023 addition of Pratt Paper (KY), LLC and multiple consumers that were mid-year 2022 additions having a full year of sales in 2023.

b. This is a leap year impact.

c. The same rationale for the Large C&I discussed in Big Rivers' response to Kentuckians for the Commonwealth/Kentucky Resource Council's Request No.1-19, subpart b, is also applied to the Direct Serve class.

d. Please see Big Rivers' response to Kentuckians for the Commonwealth/Kentucky Resource Council's Request No. 1-19. Big Rivers regularly reviews the by-class forecasts against actual metered results, and it makes adjustments as necessary for budgetary purposes. However, these adjustments are usually small and are typically only for a few months into the future.

Witnesses: Matt Sekeres and Steve Fenrick (Clearspring) (for subparts a, b, and c)
Terry Wright, Jr. (Big Rivers) (for subpart d)

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REQUEST NO. 1-21: *Refer to page A-34 of Appendix to the IRP. For each of the*

17 Direct Serve consumers in 2023:

- a. Produce the current contracts for energy sales with each of the Direct Serve consumers.*
- b. For each contract for sales to Direct Serve consumers, identify the amount of energy sales per year under the contract, the price at which such sales are made, and the expiration date for the contract.*
- c. For each Direct Serve consumer, explain the status of any discussions or efforts to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of the current contract.*
- d. Identify each Direct Serve consumer that has stated an intent not to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of their current contract.*

RESPONSE: Big Rivers objects to this request as overly broad and unduly burdensome. Big Rivers further objects because this request seeks irrelevant or inappropriate information, as well as proprietary information of third parties that are not parties to this proceeding. Subject to the foregoing, Big Rivers states as follows.

a. A copy of the public versions of Big Rivers' contracts can be found on the Public Service Commission's website at:

<https://psc.ky.gov/Home/Library?type=Tariffs&folder=Electric%5CBig%20Rivers%20Electric%20Corporation>

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b. – d. See objections, above. Please also see the response to Kentuckians for the Commonwealth and Kentucky Resources Council's Request No. 1-22 for Direct Serve sales projections.

Witness: Terry Wright, Jr.

For the Objection(s): Counsel

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REQUEST NO. 1-22: *Refer to pages A-43 and A-44 of Appendix A to the IRP.*

*Identify the percentage of sales projected to be contributed by the Direct Serve class in each of
the years 2024 through 2041.*

RESPONSE:

Year	Direct Serve %
2024	48.1%
2025	48.7%
2026	48.6%
2027	48.5%
2028	48.4%
2029	48.3%
2030	48.2%
2031	48.1%
2032	47.9%
2033	47.8%
2034	47.7%
2035	47.6%
2036	47.5%
2037	47.3%
2038	47.2%
2039	47.2%
2040	47.1%
2041	47.0%

Witnesses: Matt Sekeres and Steve Fenrick (Clearspring)

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REQUEST NO. 1-23: *Refer to page A-45 of Appendix A to the IRP. With regards*

to Non-Member Energy Sales:

- a. Identify and produce any analysis or calculation showing that the transactions with any or all of the Non-Member Energy customers have “derive(d) value for the Big Rivers Members” over any of the years 2018 through 2023, including any workpapers, modeling input and output files, or other documentation supporting the same.*
- b. Identify and produce any projection or forecast of the “value for the Big Rivers Members” that would be derived from Non-Member Energy customers in any of the years 2024 through 2042.*

RESPONSE:

- a. Please see the attachment to this response for the actual Gross Margin analyses for the Non-Member Energy customer contracts for years 2018 through 2023.
- b. Please see the attachment to this response for the forecast Gross Margin analyses for the Non-Member Energy customer contracts for years 2024 through 2037.

Witness: Christopher A. “Chris” Warren

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REQUEST NO. 1-24: *Refer to pages A-45 and A-46 of Appendix A to the IRP.*

With regards to NonMember Energy Sales:

- a. Identify and produce any forecast or estimate of Non-Member Energy Sales (whether to current or potential future Non-Member Energy customers) in any of the years of 2030 through 2042.*
- b. Produce the current contracts for energy sales with each of the Non-Member Energy customers.*
- c. For each contract for Non-Member Energy Sales, identify the amount of energy sales per year under the contract, the price at which such sales are made, and the expiration date for the contract.*
- d. For each Non-Member Energy Sales customer, explain the status of any discussions or efforts to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of the current contract.*
- e. Identify each Non-Member Energy Sales customer that has stated an intent not to extend, renew, or otherwise continue contracting for energy sales beyond the expiration of their current contract.*

RESPONSE:

- a. Please see Big Rivers' response to Item 23 of Kentuckians for the Commonwealth and Kentucky Resource Council's First Request For Information.
- b. Big Rivers has filed each of the contracts with the Kentucky Public Service Commission and copies can be found on the KPSC website at

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<https://psc.ky.gov/Home/Library?type=Tariffs&folder=Electric%5CBig%20Rivers%20Electric%20Corporation%5CContracts>.

- c. Big Rivers objects to this request as overly broad and not reasonably calculated to lead to relevant information. Notwithstanding this objection, please see Big Rivers' response to Item 23 of Kentuckians for the Commonwealth and Kentucky Resource Council's First Request For Information.
- d. Big Rivers is in discussions with OMU about contract renewal. No terms have been agreed to. Big Rivers will have discussion with KyMEA closer to the end of the current contract term.
- e. Big Rivers has informed the Nebraska entities that it will not renew those contracts.

Witness: Terry Wright, Jr.

For the Objection(s): Counsel

IN THE MATTER OF:
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REQUEST NO. 1-25: *Refer to page A-49 of Appendix A to the IRP.*

- a. *Explain why your 2023 Load Forecast shows no changes to the coincident peak contribution of the Direct Serve class in every year from 2025 through 2042.*
- b. *Has Big Rivers created or reviewed any forecast of the Direct Serve class coincident peak contribution for any of the years 2025 through 2042?*
 - i. *If so, identify and produce such forecast, including any workpapers, modeling input and output files, and other documents supporting such forecast.*
 - ii. *If not, explain why not.*

RESPONSE:

- a. Please see Big Rivers' response to Kentuckians for the Commonwealth/Kentucky Resource Council's Request 1-20, part c.
- b. Please see Big Rivers' response to Kentuckians for the Commonwealth/Kentucky Resource Council's Request No. 1-20, part d.

Witnesses: **Matt Sekeres and Steve Fenrick (Clearspring) (for part a)**
 Terry Wright, Jr. (Big Rivers) (for part b)

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REQUEST NO. 1-26: *Refer to page A-50 of Appendix A to the IRP. With regards*

to Non-Member Capacity Sales:

- a. Identify and produce any forecast or estimate of Non-Member Capacity Sales (whether to current or potential future Non-Member Energy customers) in any of years of 2029 through 2042.*
- b. Produce the current contracts for capacity sales with each of the NonMember Capacity customers.*
- c. For each contract for Non-Member Capacity Sales, identify the amount of capacity sales per year under the contract, the price at which such sales are made, and the expiration date for the contract.*
- d. For each Non-Member Capacity Sales customer, explain the status of any discussions or efforts to extend, renew, or otherwise continue contracting for capacity sales beyond the expiration of the current contract.*
- e. Identify each Non-Member Capacity Sales customer that has stated an intent not to extend, renew, or otherwise continue contracting for capacity sales beyond the expiration of their current contract.*

RESPONSE:

- a. Please see Big Rivers' response to Item 11 of Kentuckians for the Commonwealth and Kentucky Resource Council's First Request For Information.
- b. Big Rivers has filed each of the contracts with the Kentucky Public Service Commission and copies can be found on the KPSC website at

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<https://psc.ky.gov/Home/Library?type=Tariffs&folder=Electric%5CBig%20Rivers%20Electric%20Corporation%5CContracts>.

- c. Big Rivers objects to this request as overly broad and not reasonably calculated to lead to relevant information. Notwithstanding this objection, please see Big Rivers' response to Item 11 of Kentuckians for the Commonwealth and Kentucky Resource Council's First Request For Information.
- d. Please see Big Rivers' response to Item 24 of Kentuckians for the Commonwealth and Kentucky Resource Council's First Request For Information.
- e. Please see Big Rivers' response to Item 24 of Kentuckians for the Commonwealth and Kentucky Resource Council's First Request For Information.

Witness: Terry Wright, Jr.

For the Objections: Counsel

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REQUEST NO. 1-27: *Refer to page A-51 of Appendix A to the IRP. Identify and produce any forecast or estimate of the non-coincident peak contribution of current or potential future Non-Member Sales customers in any of the years 2029 through 2042.*

RESPONSE: Big Rivers is not forecasting Non-Member sales in any of the years 2029 through 2042.

Witness: Terry Wright, Jr.

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REQUEST NO. 1-28: *With respect to cryptocurrency facilities in Big Rivers*

territory:

- a. Identify all currently operating cryptocurrency facilities in Big Rivers territory by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load factor, and which consumer class they belong to.*
- b. Identify all proposed cryptocurrency facilities that you anticipate will begin operating in Big Rivers territory in the next three years by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load factor, and to which consumer class they would belong.*
- c. For each currently operating or proposed cryptocurrency facility identified in response to paragraphs (a) and (b), please explain in detail whether or how you have incorporated the facility into the load forecast for this IRP.*
- d. Identify the projected cryptocurrency capacity need (in MW) in Big Rivers territory for each of the years 2023 through 2042.*

RESPONSE:

- a. The only cryptocurrency facility Big Rivers is aware of that supplies through its members is Block Mining, Inc., which is in the Large Industrial Customer class. This facility is located at 5501 Commerce Drive, Paducah, Kentucky 42001. The initial maximum contract demand is [REDACTED] and can change annually. Block Mining is required to achieve a 50% minimum load factor each month. The firm capacity amount has been [REDACTED] in 2023.
- b. There are currently none.

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- c. Big Rivers has not forecasted any additional cryptocurrency facilities in this IRP.
- d. See response c., above.

Witness: Terry Wright, Jr.

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REQUEST NO. 1-29: *With respect to data centers in Big Rivers territory:*

- a. Identify all currently operating data centers in Big Rivers territory by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load factor, and which consumer class they belong to.*
- b. Identify all proposed data centers that you anticipate will begin operating in Big Rivers territory in the next three years by name, location, capacity need (in MW), percentage of capacity need that is firm capacity, anticipated load factor, and to which consumer class they would belong.*
- c. For each currently operating or proposed data center identified in response to paragraphs (a) and (b), please explain in detail whether or how you have incorporated the facility into the load forecast for this IRP.*
- d. Identify the projected data center capacity need (in MW) in Big Rivers territory for each of the years 2023 through 2042.*

RESPONSE:

- a. Big Rivers supplies no data centers on a Direct-Serve basis.
- b. There are currently none.
- c. Big Rivers has not forecasted any data center load in this IRP.
- d. See response c., above.

Witness: Terry Wright, Jr.

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REQUEST NO. 1-30: *Refer to page E-3 of Appendix B to the IRP. For each of
the Achievable, Economic, and Technical energy efficiency potential savings levels, identify:*

- a. The annual spending for 2024 through 2033 needed to achieve each level of energy efficiency savings potential.*
- b. The Total Resource Cost (“TRC”) benefit-cost ratio for each level of energy efficiency savings potential.*

RESPONSE: By definition, Technical and Economic potential savings estimates are abstract concepts and disassociated from the real world. Please refer to page 1-7 of Appendix B, where the definitions of the various study potentials are provided: “Both technical and economic potential represent theoretical abstractions of demand-side savings that ignore the ‘real-world’ obstacles of implementing such programs. These include utility budgets, administrative capacity, market barriers, and customer preferences and behaviors.” It assumes, in both cases, the “instantaneous” adoption of all available energy efficiency measures.

While the data does exist to calculate the requested items in subparts a. and b., it should be noted that the cost and benefit data are derived from the individual efficiency measure economic models and would understate the true cost of attaining “instantaneous” adoption as described above for the Technical and Economic potential scenarios. This would likely make the cost orders of magnitude larger (and therefore reduce the benefit-cost calculation). Subject to those caveats, the requested calculations are as follows.

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a) Spending levels

- i. Technical Potential = \$2.54 billion in 2024
- ii. Economic Potential = \$1.28 billion in 2024
- iii. Achievable Potential = \$96 million through 2033

b) TRC values

- i. Technical Potential = 2.0
- ii. Economic Potential = 2.7
- iii. Achievable Potential = 3.0

Witness: Joshua Hoyt (Clearspring)

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REQUEST NO. 1-31: *For each of the energy efficiency and demand response programs evaluated in the Demand-Side Management Potential Study included as Appendix B to the IRP, answer the following requests:*

- a. *Explain in detail how avoided costs were determined for each cost benefit test used (e.g., Total Resource Cost, Utility Cost, Participant Cost, Rate Impact Measure)*

- b. *Provide the values used for each element of the avoided cost categories listed below, identify the source of the values used, and state whether the values are in nominal dollars or in real, inflation-adjusted dollars.*
 - i. *Energy cost*

 - ii. *Capacity cost*

 - iii. *Capacity reserves (if not included in capacity costs)*
 - iv. *Natural gas price*

 - v. *Environmental externalities, including avoided methane loss from gas transmission, distribution, and storage infrastructure*

 - vi. *Line losses, for energy and peak (please specify if the estimate is based on average or marginal line loss rates)*

- c. *State whether any of the following avoided cost categories listed below are included in the Companies' avoided cost calculation and if so, please provide the value, source of the value, and state whether the value is in nominal dollars or in real, inflation-adjusted dollars.*
 - i. *Ancillary services*

 - ii. *Transmission and distribution*

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- iii. *Non-energy benefits (“NEBs”) (please specify which NEBs are included, if any)*
- iv. *Increased reliability*
- v. *Reduced risk (e.g., reduced exposure to future fuel price volatility, future environmental regulation compliance costs, uncertainties of demand forecasts and related capital investments, etc.)*
- vi. *Any other avoided cost values incorporated into cost-effectiveness analysis.*

RESPONSE:

a. Avoided Cost is the value of energy and demand avoided by the power supply utility. The Big Rivers' avoided cost was provided by ACES Power Marketing's forward market price curves for MISO Zone 6. It is an input to the Total Resource Cost (TRC), Utility Cost Test (UCT), and Rate Impact Measure (RIM) calculations. The Participant Cost Test uses the average retail energy rate as the avoided energy cost value, which is determined from actual member data and escalated by Big Rivers' avoided cost and projected O&M growth. Avoided capacity and avoided demand are interchangeable.

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b. Please see below.

i. Avoided cost values used in the DSM study are presented below in nominal

dollars:

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	Retail Average Electric Cost	
	Residential \$/kWh	Non-Residential \$/kWh
2023		
2024		
2025		
2026		
2027		
2028		
2029		
2030		
2031		
2032		
2033		
2034		
2035		
2036		
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2053		

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- ii. Please see the response to subpart i., above.
 - iii. Forward curve values do not include reserve values. Only capacity forecast values were used.
 - iv. No avoided natural gas values were used.
 - v. No environmental externality values were used.
 - vi. Average annual distribution losses = 4.5%, and average annual transmission losses = 2.34%. Losses are applied to the energy and demand saved during the calculation process and are thus incorporated.
- c. None of the listed categories are included in the ACES marketing forward curves.

Witnesses: Joshua Hoyt, Clearspring (for subparts a and b)
Russell L. Pogue (for subpart c)

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REQUEST NO. 1-32: *Refer to page 80 of the IRP, and page 83 of Big Rivers'*

2020 IRP.

- a. Given that the current IRP demand-side management potential study found a TRC ratio of 3.1 for a \$1 million per year energy efficiency program, and the 2020 IRP found a TRC ratio of 2.5 to 2.7 for a \$2 million and \$1 million program, respectively, explain in detail why Big Rivers has not yet sought Commission approval for any new proposed DSM programs.*
- b. State whether you anticipate seeking Commission approval for any new proposed energy efficiency programs in the next three years. If not, explain why not.*

RESPONSE:

- a. It is anticipated that the Kentucky Energy and Environment Cabinet will use federal grant funding to develop energy efficiency programs available to residents of Kentucky. Big Rivers is monitoring this development.
- b. Big Rivers will continue to evaluate energy efficiency programs and will seek Commission approval of any new programs to the extent such approval is required by law.

Witness: Nathaniel A. Berry

IN THE MATTER OF:
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REQUEST NO. 1-33: *Refer to page 87 of the IRP, and page 88 of Big Rivers'*

2020 IRP.

- a. Given that the current IRP found 13 demand response programs to have a TRC ratio higher than 1, and that the 2020 IRP found four demand response programs with a TRC ratio higher than 1, explain in detail why Big Rivers has not yet sought Commission approval for any new demand response programs.*
- b. State whether you anticipate seeking Commission approval for any new proposed demand response programs in the next three years. If not, explain why not.*

RESPONSE:

a. Demand response is a highly technical subject for a G&T market participant of MISO. Big Rivers has initiated discussions with its Member-Owners and other G&Ts, both in and out of MISO. There is a great deal of technology development and innovation occurring around the country, and Big Rivers and its Member-Owners are observing so that lessons learned from these efforts can be appropriately considered in future program offerings.

b. Big Rivers will continue to evaluate demand response programs, and it will seek Commission approval of any new programs to the extent required by law and Commission precedent.

Witness: Nathaniel A. Berry

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REQUEST NO. 1-34: *Refer to page 81 of the IRP. With regards to the DSM-14*

Low-Income Weatherization Program-Pilot:

- a. Identify the level of activity in the Program in 2019, 2020, and 2021.*
- b. Describe the steps that Big Rivers has taken since 2019 to promote and encourage participation in the Program.*
- c. Identify the amount that Big Rivers has spent each year since 2019 to promote and encourage participation in the Program.*
- d. State whether Big Rivers has analyzed why no activity in the Program has been seen since March 31, 2021. If so, explain the results of such analysis and produce any written documentation regarding such analysis. If not, explain why not.*

RESPONSE:

- a. Attached to this response is a copy of progress reports for the Low-Income Weatherization Support Program Pilot filed with the KPSC in Case No. 2019-00193,¹ for 2020, 2021 and 2022.
- b. Big Rivers' Energy Services staff has maintained contact with staff from the Kentucky Housing Corp ("KHC") to encourage the use of the funding to allow applicable projects to be completed.

¹ *In the Matter of: Electronic Demand-Side Management Filing of Big Rivers Electric Corporation to Implement a Low-Income Weatherization Support Program, Case No. 2019-00193.*

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- c. See the attached progress reports for the Low-Income Weatherization Support Program Pilot for 2020, 2021 and 2022.
- d. See the attached progress report for 2022. No project funding requests were received for 2023.

Witness: Russell L. Pogue

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REQUEST NO. 1-35: *Identify the currently effective coal supply contracts, including the following details for each: month/year of execution; annual delivery volumes; cost per ton; and term.*

RESPONSE: Please see the table provided with this response.

Witness: Nathaniel A. Berry

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REQUEST NO. 1-36: *Identify the month/year of Big Rivers' most recent RFP for coal supply contracts and summarize the responses received, including offered tonnage, delivered price per ton, and term.*

RESPONSE: Please see Big Rivers' responses to requests 4 and 5 of Commission Staff's First Request for Information in Case No. 2022-00041,¹ which describe the most recent RFP for coal supply contracts and responses.

Witness: Nathaniel A. Berry

¹See *In the Matter of: An Electronic Examination of the Application of the Fuel Adjustment Clause of Big Rivers Electric Corporation from May 1, 2021 Through October 31, 2021*, Case No. 2022-00041, Big Rivers' Response to Commission Staff's First Request for Information (Apr. 14, 2022).

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REQUEST NO. 1-37: *Refer to page 106 of the IRP. Produce the Big Rivers 2019-2033 Long-Term Financial Plan and any supporting workpapers and modeling input and output files, and identify the date that such Plan was created.*

RESPONSE: Big Rivers objects to this request as overly broad, unduly burdensome, and not reasonably tailored to lead to relevant or admissible evidence.

For the Objection(s): Counsel

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REQUEST NO. 1-38: *Refer to page 106 of the IRP. With regards to the IRP*

assumptions about Big Rivers' existing generation resources:

- a. Explain why you neither evaluated the economics of any retirement date for the Wilson plant, nor allowed the model the option of selecting the retirement of Wilson plant, during any year of the planning period.*
- b. Explain why you evaluated only a single retirement date for the Green units during the planning period, rather than either evaluating multiple different retirement dates or allowing the model the option of selecting an economic retirement date.*
- c. Explain why you neither evaluated the economics of any retirement date for the Reid combustion turbine, nor allowed the model the option of selecting the retirement of Reid, during any year of the planning period.*

RESPONSE:

- a. Please see Big Rivers' response to Kentuckians for the Commonwealth and Kentucky Resource Council's Request No. 1-8, subpart a.
- b. Please see Big Rivers' response to Commission Staff's Request Nos. 1-14 and 1-26.
- c. Please see Big Rivers' response to Commission Staff's Request No. 1-14.

Witness: Nathaniel A. Berry

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REQUEST NO. 1-39: *Refer to pages 107-108 of the IRP. Identify the limits on the amount and duration of reliance on the MISO market for capacity included in your modeling, and explain the basis for such limits.*

RESPONSE: Due to the design of the MISO capacity construct, the footprints' capacity needs are not fulfilled using a traditional "market" construct. MISO conducts a seasonal surplus capacity auction which is very limited in its depth and only covers the seasons in the prompt Planning Year. The EnCompass model was allowed to backfill seasonal capacity shortfalls with capacity purchases (presumably from bilateral transactions) until 2029. Following this, the model was not allowed to purchase surplus to fill the large shortfalls that would have occurred with a Green retirement because it is unknown if such a large amount of capacity would be available consistently and for how long into the future that availability would continue.

Witness: John Christensen (1898 & Co.)

IN THE MATTER OF:
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REQUEST NO. 1-40: *Refer to page 116 of the IRP. Produce the Big Rivers 2023-2037 Long-Term Financial Plan and any supporting workpapers and modeling input and output files, and identify the date that such Plan was created.*

RESPONSE: Big Rivers objects to this request as overly broad, unduly burdensome, and not reasonably tailored to lead to relevant or admissible evidence.

For the Objection(s): Counsel

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REQUEST NO. 1-41: *Refer to Table 7.1.4(e) on page 118 of the IRP. State whether the \$38.10/MWh “variable cost for Encompass model” for the Unbridled PPA includes any solar tax credits under the Inflation Reduction Act.*

- a. If so, identify in \$/MWh the amount of tax credit included.*
- b. If not, explain why not.*

RESPONSE:

- a. The \$38.10/MWh in Table 7.1.4(e) does not include any solar tax credits under the Inflation Reduction Act.
- b. The EnCompass model was based on the executed terms of the Unbridled PPA. Since National Grid is the owner of the project, they would receive the tax credits on the project.

Witness: Terry Wright, Jr.

IN THE MATTER OF:
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REQUEST NO. 1-42: *Refer to pages 119 and 145 of the IRP. Identify and produce the Energy Information Administration "public technology assessment" referenced therein.*

RESPONSE: Please refer to the documents at the following links.

Main Technology Assessment:

https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2020.pdf

Annual Cost Update:

https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf

Witness: John Christensen (1898 & Co.)

IN THE MATTER OF:
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REQUEST NO. 1-43: *With regards to the EnCompass expansion planning and
production cost modeling discussed in Chapter 7 of IRP:*

- a. Explain how and at what value the Inflation Reduction Act's expanded and extended Investment Tax Credits ("ITC") and Production Tax Credits ("PTC") were factored into the project costs for solar, wind, and battery storage resources.*
- b. Explain each way in which the ITC and PTC for solar, wind, and battery storage were factored into Big Rivers' EnCompass modeling for this IRP.*

RESPONSE:

a. The PTCs (wind) and ITCs (solar and storage) from the Inflation Reduction Act were included in the modeling. PTCs are forecasted to start at approximately \$31 /MWh in 2027. The ITC was modeled at 30%. Both tax credit types were modeled as stepping down in 2034, and then expiring in 2036. Because Big Rivers does not pay income taxes and cannot directly use the tax credits, the assumption was that Big Rivers would either receive a lump sum payment or engage with a third party to monetize the credits for the benefit of Big Rivers' Member-Owners.

b. Generic wind resources were modeled as receiving PTCs for 10 years after in-service date, assuming they are placed in service prior to expiration of the tax credits. Generic solar and storage resources were modeled as receiving a reduction in their initial capital costs, commensurate with the ITC.

Witness: John Christensen (1898 & Co.)

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Response to KFTC and KRC 1-43
Witness: John Christensen
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REQUEST NO. 1-44: *Refer to page 125 of the IRP. With regards to the
discussion of wind energy:*

- a. Explain in detail what steps Big Rivers has taken over the past five years to evaluate whether there are viable locations for wind energy in Kentucky.*
- b. Identify and produce any analysis or study that Big Rivers has carried out or reviewed of whether there are viable locations for wind energy in Kentucky.*
- c. Explain the “pricing basis risk between strong wind regionals and the Big Rivers service territory” and produce any analysis of that risk.*
- d. Produce the “rural Kentucky generation profile data” referenced therein, and explain how the production assumptions for wind that Big Rivers used are consistent with that data.*

RESPONSE: Big Rivers objects that this request is overly broad and unduly burdensome.

Subject to these objections, Big Rivers states as follows.

- a. Big Rivers personnel regularly monitors MISO's Generator Interconnection queue for wind and other generator interconnection requests in the Kentucky and nearby transmission system. There are currently only two active requests for wind interconnection, both requested by an entity in Indiana.
https://www.misoenergy.org/planning/resource-utilization/GI_Queue/
- b. Big Rivers has not carried out any studies of the viability of wind generation in Kentucky.

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- c. Kentucky's closest pocket of wind generation in MISO is in north-central Indiana. Locational Marginal Prices (LMP) of wind injections in central Indiana are often quite volatile compared with the LMPs of load in western Kentucky. Big Rivers has preferred predictable, stable resources available in Kentucky over purchasing from remote resources that introduce both volume and price risk into our portfolio. We continue to monitor advancements in wind technology and will perform analysis as wind becomes more viable in our area.
- d. The hourly generation profile used in the modeling is subject to confidentiality requirements by the 3rd party creator but represents a theoretical typical wind production pattern for the region. The annual capacity factor of this profile is roughly 28%.

Witnesses: Terry Wright, Jr. (Big Rivers) (for subparts a, b, and c)
John Christensen (1898 & Co.) (for subpart d)

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REQUEST NO. 1-45: *Refer to pages 125-26 of the IRP. With regards to the
potential DSM program that was evaluated as part of the IRP:*

- a. Explain the basis for assuming a \$1 million (nominal) annual program budget for the potential DSM program.*
- b. Explain why you did not evaluate a potential DSM program with a higher annual budget, such as \$2 million or \$4 million per year.*
- c. Explain why you did not evaluate a DSM program reflecting the achievable potential identified in your DSM Potential Study.*
- d. Explain why you did not evaluate a DSM program reflecting the economic potential identified in your DSM Potential Study.*

RESPONSE:

- a. Big Rivers analyzed an assumed \$1 million annual budget because it believes that is a reasonable amount, which is also consistent with analyses conducted in prior IRP filings.
- b. See response to a., above.
- c. See response to a., above.
- d. See response to a., above.

Witness: Russell L. Pogue

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REQUEST NO. 1-46: *Refer to Tables 7.2.1(a) and (b) on pages 135-36 of the IRP.*

- a. Explain in detail the basis for the annual project capacity limit in the EnCompass modeling of 300 MW for 4-Hour Storage, and 200 MW for each of Solar PV and Wind, as opposed to higher limits for those resources.*
- b. Identify and produce any studies, analysis, or other documents supporting the annual project capacity limits referenced in response to subpart a above.*
- c. Explain in detail the basis for the cumulative project capacity limit in the EnCompass modeling of 600 MW for 4-Hour Storage, as opposed to a higher limit.*
- d. Identify and produce any studies, analysis, or other documents supporting the cumulative project capacity limit for 4-Hour Storage referenced above.*

RESPONSE:

a. Please see the response to Commission Staff's Request No. 1-32 and Kentuckians for the Commonwealth & Kentucky Resources Council's Request No. 1-53(c). Because the model was configured to dispatch energy against the forecasted LMPs for each resource and the model was allowed to add economic resources regardless of energy or capacity need, limits were required to prevent the model from selecting unlimited amounts of each resource.

b. Limits on annual builds of wind, solar, and storage, were set based on considerations of how much of each technology Big Rivers' believed it could develop annually given the financial and personnel requirements to do so.

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c. The maximum limit of approximately 600 MW of 4-hour storage was set to allow the model to select a roughly equal amount of capacity from storage as the other generic resource types.

d. See response to subpart (c), above.

Witness: John Christensen (1898 & Co.)

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REQUEST NO. 1-47: *Refer to Tables 7.2.1(a) and (b) on pages 135-36 of the IRP.*

Confirm that the EnCompass model was allowed to select Big Rivers' \$1 million DSM program only in 2024, as opposed to in any later year.

RESPONSE: All the cost and performance assumptions related to the DSM program were developed assuming that the first year would be 2024. As such, the model was developed to determine if such a program was in the best interests of Big Rivers' Members to pursue promptly.

Witness: **John Christensen (1898 & Co.)**

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REQUEST NO. 1-48: *State whether you allowed the EnCompass model to select an economic resource (i.e. a resource that would reduce the NPV cost of a portfolio) in a particular year even if there was not an energy or capacity need in that year. If not, explain why not.*

RESPONSE: The EnCompass model was allowed to select an economic resource even when there is not an energy or capacity need.

Witness: **John Christensen (1898 & Co.)**

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REQUEST NO. 1-49: *Refer to Table 7.1.4(a) on page 114 of the IRP, and Table*

7.2.1(a) on page 135 of the IRP.

- a. *Explain why Table 7.1.4(a) identifies 2022 as the “First Available Year” for 4-Hour Li-Ion BESS in the EnCompass modeling, while Table 7.2.1(a) does not show an annual resource constraint for 4-hour storage in the EnCompass model until 2029.*
- b. *State whether, besides the PACE 4-hour storage project, any 4-hour storage resources could be selected in your EnCompass modeling before 2029.*
 - i. *If so, identify the years in which such 4-hour storage resources could be selected, and any limits on such resources before 2029.*
 - ii. *If not, explain why not.*
- c. *Explain why Table 7.1.4(a) identifies 2023 as the “First Available Year” for Solar PV resources in the EnCompass modeling, while Table 7.2.1(a) does not show an annual resource constraint for Solar PV in the EnCompass modeling until 2027.*
- d. *State whether any Solar PV resources could be selected in your EnCompass modeling before 2027.*
 - i. *If so, identify the years in which Solar PV resources could be selected, and any limits on the amount of such resources that could be selected, before 2029.*
 - ii. *If not, explain why not.*
- e. *Explain why Table 7.1.4(a) identifies 2024 as the “First Available Year” for Wind resources in the EnCompass modeling, while Table 7.2.1(a) does not show an annual resource constraint for Wind in the EnCompass modeling until 2028.*
- f. *State whether any Wind resources could be selected in your EnCompass modeling before 2028.*

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- i. *If so, identify the years in which Wind resources could be selected, and any limits on the amount of such resources that could be selected, before 2028.*
- ii. *If not, explain why not.*

RESPONSE:

a, c, e. Table 7.1.4(a) contains a mistake and should have stated the years which align with the data presented in Table 7.2.1(a) and Table 7.2.1(b). Please see the corrected summary of first available year(s) below:

Resource Options for EnCompass Model								
Name	First Available Year	Max Capacity (MW)	Heat Rate (Btu/kWh)	Forced Outage Rate (%)	Minimum Uptime (hours)	Minimum Downtime (hours)	Ramp Up Rate (MW/min)	Ramp Down Rate (MW/min)
Existing (Currently Operating) Big Rivers Assets								
Green Unit 1	In Service	231	Table 7.2	14	24	24	3	3
Green Unit 2	In Service	223	Table 7.2	14	24	24	3	3
Reid	In Service	65	Table 7.2	10	24	24	3	3
Wilson	In Service	412	Table 7.2	6.5	24	24	2.5	2.5
New/Potential Big Rivers Assets								
Unbridled Solar	2024	160	NA	NA	NA	NA	NA	NA
BREC CC	2029	635	Table 7.3	1	1	1.5	47	47
Reciprocating Engine	2029	21	8295	3	1	1	25	25
Simple Cycle Gas Turbine	2029	237	9905	3	1	1	25	25
Solar PV	2027	100	NA	NA	NA	NA	NA	NA
Onshore Wind	2028	100	NA	NA	NA	NA	NA	NA
4-Hour Li-Ion BESS	2029	50	NA	NA	NA	NA	NA	NA
Aeroderivative	2029	105	9124	3	1	1	25	25

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b,d, f. Please refer to Table 7.2.1(a). No generic resources were selectable prior to the years outlined in Table 7.2.1(a). This is due to expected timeframes for successful development of generic projects and technology construction constraints.

Witness: John Christensen

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REQUEST NO. 1-50: *Refer to page 145 of the IRP. Identify and produce the
“EIA’s public technology assessment” and the “EPA estimates for carbon capture
technologies” referenced therein.*

RESPONSE: Please see the response to Kentuckians for the Commonwealth and
Kentucky Resources Council’s Request No. 1-42.

Witness: John Christensen (1898 & Co.)

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REQUEST NO. 1-51: *Refer to pages 145-46 of the IRP. With regards to the*

discussion therein of Carbon Capture and Sequestration ("CCS"):

- a. *State whether Big Rivers has identified secure geological storage site(s) to which its captured carbon emissions could be transported for permanent sequestration. If so:*
 - i. *Identify such site(s) and produce any analysis of their suitability for permanent sequestration.*
 - ii. *State whether sufficient CO2 pipeline infrastructure exists to enable transport of the captured CO2 to the site(s) and, if not, the estimated cost of building such infrastructure.*
- b. *Identify the basis for the assumption that the carbon capture equipment would capture 90% of CO2 emissions from Wilson or the new gas combined cycle plant, and produce any analyses supporting that capture rate.*
- c. *Identify the outage rate that you assumed for the Wilson plant, the gas combined cycle plant, and the carbon capture technology in your modeling of the ACR Portfolio.*

RESPONSE:

- a. Yes, Big Rivers has preliminarily identified a geological formation suitable for carbon emissions storage.
 - i. Big Rivers has identified the Cambro-Ordovician Knox Group, but detailed analysis has not been performed at this time, pending information regarding

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review of its Letter of Interest submitted in the New ERA program, as described in subpart b, below.

ii. The Knox Group formations are present below the D.B. Wilson Station, so Big Rivers anticipates nominal pipeline infrastructure will be required. Big Rivers does not have detailed estimates specific to infrastructure at this time.

b. Big Rivers' carbon capture estimates are preliminary, based on current published research, and will be further evaluated as Big Rivers learns of the status of its Letter of Interest submitted in the New ERA program.

c. The Forced Outage Rate for Wilson was modeled as 6.5%. The Forced Outage Rate for the BREC CC was modeled as 1%. There was no explicit modeling of a Forced Outage Rate on Carbon Capture Technology.

Witnesses: Erin M. Murphy (subparts a and b)

John Christensen (1898 & Co.) (subpart c)

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REQUEST NO. 1-52: *Refer to Table 7.4.1(c) on page 155 of the IRP. With
regards to the annual levels of coal generation projected by the EnCompass modeling:*

- a. Explain why coal generation falls by more than 60% from 2024 to 2026 (from 3,093 GWh to 1,140 GWh).*
- b. Explain why annual coal generation remains below 1,000 GWhs in every year from 2027 through 2031.*
- c. Explain why coal generation more than doubles from 2031 to 2033 (from 981 GWh to 2,136 GWh) and then remains above 2,000 GWh per year through 2042.*

RESPONSE: Please see the response to Commission Staff's Request No. 1-23.

Witness: John Christensen (1898 & Co.)

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REQUEST NO. 1-53: *Compare Table 7.1.6(a) on page 132 to Table 7.4.1(c) on
page 155 of the IRP.*

- a. Confirm that you are forecasting between 4,700 and 4,900 GWh of total energy needs per year for every year of 2030 through 2042. If not confirmed, explain your answer.*
- b. Confirm that your EnCompass modeling projects total generation of more than 6,500 GWh in 2030, increasing to more than 8,000 GWh per year for every year from 2034 through 2042. If not confirmed, explain your answer.*
- c. Explain why you are planning to generate 1,000s of GWh more energy in each of the years 2030 through 2042 than needed to serve Big Rivers total forecasted energy needs.*
- d. Identify and produce any analysis of the costs, benefits, and/or risks to ratepayers of Big Rivers planning to generate 1,000s of GWh more energy in each of the years 2030 through 2042 than needed to serve total forecasted energy needs.*

RESPONSE:

- a. Confirmed.
- b. Confirmed.
- c. Please see the response to Commission Staff's Request No. 1-32. The EnCompass model was developed to dispatch each included generating unit against the forecasted hourly LMP based on its projected dispatch cost in each hour. This is done to mimic the behavior of the MISO energy market within the modeling. This shows that the Big Rivers portfolio is economically

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competitive against other resources in the MISO footprint. The net excess generation identified in this request would presumably be utilized by other load serving entities in MISO.

d. Since the units will only generate if their variable costs are less than the local LMP, all energy generation should be producing positive revenue for Big Rivers' members in relation to generator variable costs which would reduce the total overall costs of owning and operating the unit(s).

Witness: John Christensen (1898 & Co.)

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REQUEST NO. 1-54: *Refer to pages 156-158 of the IRP. Identify the annual generation by fuel type for each of the years 2023 through 2042 from the EnCompass modeling of the Alternative Portfolio.*

RESPONSE: Please see the Excel workbook provided with this response.

Witness: John Christensen (1898 & Co.)

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REQUEST NO. 1-55: *Refer to page 181 of the IRP. With regards to Big Rivers' plan to "[c]ontinue MISO Generator Interconnection Agreement process to ensure cost and ability to interconnect a NGCC unit":*

- a. Identify when Big Rivers initiated the referenced Interconnection Agreement process.*
- b. Explain the current status and estimated remaining timeline of such process.*
- c. Produce any generation interconnection application, including attachments, that Big Rivers has submitted to MISO for an NGCC unit.*

RESPONSE:

- a. Application ID 39996 was submitted by Big Rivers on 9/15/2022.
- b. As an application that has been verified and included in the DPP-2022-Cycle in the Central Region, this Interconnection request is currently scheduled to start the first of 3 Definitive Planning studies on 3/27/2024. If the current schedule is adhered to, the scheduled date for Generator Interconnection Application execution is 12/12/2024, however any delays in start date or interim study completion dates will delay ultimate Generator Interconnection application execution. This schedule has slipped in the past and likely will be delayed further. See attached to this response, a copy of MISO's Definitive Planning Phase Schedule dated December 1, 2023.

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c. Details for Project 3089 are available on MISO's Generator Interconnection

QueueMISO's website at https://www.misoenergy.org/planning/resource-utilization/GI_Queue/gi-interactive-queue/

Witness: Nathaniel A. Berry

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REQUEST NO. 1-56: *Has Big Rivers engaged stakeholders, including residential customers, in the development of this IRP?*

- a. If so, explain how and provide copies of all materials concerning the IRP shared with stakeholders, and any comments submitted to Big Rivers by stakeholders during the IRP development process.*
- b. If not, explain why not.*

RESPONSE: Big Rivers regularly engages with its stakeholders, particularly its three Member-Owners, in connection with its resource planning efforts, and certainly (with and through those Member-Owners) remains cognizant of the interests of all customer classes, including its Member-Owners' residential customers. Moreover, upon filing the 2023 IRP, Big Rivers caused to be published a Notice of Filing, in newspapers of general circulation in Big Rivers' service area, in compliance with 807 KAR 5:058, Section 10. Big Rivers filed proof of publication in this proceeding on October 26, 2023, including: (i) an affidavit from Kentucky Press Service certifying that the Notice of Filing was published in twenty-six newspapers; and (ii) a copy of the tearsheet from each newspaper.

Further, on September 29, 2023, pursuant to 807 KAR 5:058 Section 2(2), Big Rivers mailed notice to the intervenors in its last integrated resource plan review proceeding, Case No. 2020-00299.

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Witness: Nathaniel A. Berry

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REQUEST NO. 1-57: *Please identify the current compliance status of the Wilson facility with current Effluent Limitations Guidelines for steam electric power plants, as updated by EPA in 2020.*

- a. Please describe in detail any compliance projects that have been proposed to and/or approved by the Commission, with reference to any cases in which such projects were proposed and/or approved, and state the current status of such projects and expected timing of their completion.*
- b. Has the Company assessed how much additional cost would be required to comply with EPA's proposed supplemental Effluent Limitations Guidelines rule, which was published in the Federal Register on March 29, 2023 (88 Fed. Reg. 18,824)? If yes, please describe in detail what additional projects would be required to comply with the requirements of that proposed rule (if finalized as proposed) and the current cost estimate for those projects. If not, please explain in detail why not.*
- c. The proposed supplemental rule (if finalized as proposed) would change the technology basis for FGD wastewater requirements and require zero discharge. Please identify what steps the Company would need to take at Wilson to comply with these proposed rule changes and the estimated minimum amount of time that the Company would need to complete those steps.*
- d. The proposed supplemental rule (if finalized as proposed) would change the technology basis for bottom ash transport water requirements and require zero discharge. Please identify what steps the Company would need to take at Wilson to comply with these proposed rule changes and the estimated minimum amount of time that the Company would need to complete those steps.*
- e. The proposed supplemental rule (if finalized as proposed) would require additional wastewater treatment for combustion residual leachate prior to discharge. Please identify what steps the Company would need to take at Wilson to comply with these proposed rule changes and the estimated minimum amount of time that the Company would need to complete those steps.*

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RESPONSE: Big Rivers objects to the extent that this request includes factual assertions or legal conclusions that are not contained in Big Rivers' IRP or otherwise outside the scope of this proceeding. Without waiving this objection, Big Rivers states that Wilson Station is in full compliance with all relevant aspects of the 2020 ELG Rule.¹ The remaining subsections relate to the pending 2023 Supplemental ELG rule which has not yet been finalized by the EPA. Big Rivers plans on conducting a comprehensive study of the rule in 2024 to identify corresponding impacts.

Witness: Michael S. Mizell

For the Objection(s): Counsel

¹ See *In the Matter of: Application of Big Rivers Electric Corporation for Approval of Its 2020 Environmental Compliance Plan, Authority to Recover Costs Through a Revised Environmental Surcharge and Tariff, the Issuance of a Certificate of Public Convenience and Necessity for Certain Projects, and Appropriate Accounting and Other Relief*, Case No. 2019-00435.

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REQUEST NO. 1-58: *Please refer to pages 95-98 of the IRP, dealing with contributions to nonattainment of National Ambient Air Quality Standards (NAAQS).*

- a. Please explain the assertion at page 97 that the Revised CSAPR Rule Update relating to contributions to violations of the 2008 ozone NAAQS involved denials of SIP applications that are currently subject to litigation in several Federal Courts of Appeal, and cite which cases are being referred to.*
- b. Please explain any evaluation Big Rivers has undertaken of the June, 2023 Good Neighbor Plan for the 2015 ozone NAAQS, 88 FR 36654 ("Good Neighbor Plan"), including how Big Rivers would comply with the final emissions allowances if the stay of the disapproval of the SIP related to the 2015 ozone NAAQS were lifted or similar reductions were otherwise required.*
- c. Produce any analysis Big Rivers has conducted related to the Good Neighbor Plan's impact on dispatch or operation of any of its facilities.*
- d. Identify and produce any analysis that Big Rivers has carried out or reviewed of the impact on residential and industrial customers' rates of implementing the Good Neighbor Plan.*

RESPONSE:

a. Big Rivers states that its references to the SIP denials being subject to litigation and the Good Neighbor Rule related to the 2015 ozone NAAQS. There are numerous pending lawsuits in various federal circuits that address legal issues with EPA's Good Neighbor Rule and the Federal Implementation Plan ("FIP") issued by EPA. The Commonwealth of Kentucky is a litigant

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in one of these cases.¹ In response to those litigation cases, on July 31, 2023, 2023 EPA itself issued an interim final rule "First Interim Final Rule" to stay the effectiveness of the FIP in Arkansas, Kentucky, Louisiana, Mississippi, Missouri and Texas.²

b. Given the ongoing legal proceedings, including the stay of the disapproval of the SIP, Big Rivers has not conducted any such formal evaluation or analysis at this time.

c. See response to subpart b., above.

d. See response to subpart b., above.

Witness: Michael S. Mizell

¹ See Kentucky v. U.S. EPA, et al., Case No. 23-3216, March 13, 2023.

² See 88 FR 49295.

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REQUEST NO. 1-59: *Please refer to pages 99–100 of the IRP.*

- a. Please identify any “legacy ponds” or “CCR Management Units” – as those terms are defined in the May 18, 2023 proposed rule – that are present at Coleman, Green, Reid/HMP&L, or Wilson generating stations.*
- b. Please identify the “various industry trade groups” that are referenced in the IRP and please explain how the Company is “involved with [those groups] in litigation challenging the proposed rule.”*
- c. Please identify the “litigation challenging the proposed rule” that the Company is “involved with” and specify whether any ratepayer funds are being used to support any such litigation. If ratepayer funds are being used to support any such litigation, please explain in detail and identify the amount of funds that the Company is contributing to such litigation and the Company’s justification for doing so.*

RESPONSE:

a. Big Rivers objects to this request as premature and inappropriate, particularly to the extent it requires Big Rivers to opine as to the applicability of possible definitions in a proposed rule that is not finalized. Subject to the foregoing objections, Big Rivers states: the CCR “Legacy Pond” rule proposed on May 18, 2023, has not yet been finalized and, as such, the terms “legacy ponds” and “CCR Management Units” have not yet been finalized. It would therefore be premature for Big Rivers to attempt to “identify” such units within its system.

b. Big Rivers objects to the extent that this request seeks information protected by the attorney-client and attorney work product privileges. Subject to the foregoing objections, Big

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Rivers states it is a member of both the National Rural Electric Cooperative Association (“NRECA”) and the Utility Solid Waste Activities Group (“USWAG”) and, as such, participates with each organization in both commenting on and collectively developing litigation strategies challenging EPA actions, as appropriate. Both entities submitted public comments on the “Legacy Pond” rule, and Big Rivers participated in the comment development process, but there is no active litigation at present.

c. Please see the answer to subpart b., above.

Witness: Michael S. Mizell

For the Objection(s): Counsel

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REQUEST NO. 1-60: *Refer to pages 93 – 95 of the IRP, which discusses EPA's*

“Proposed GHG Rule”:

- a. *Produce any comments that Big Rivers submitted to EPA regarding the Proposed GHG Rule.*
- b. *With regards to your reference on page 94 of the IRP to the “exceptionally high costs of implementation” of the Proposed GHG Rule, identify and produce any analysis that Big Rivers has carried out or reviewed of the cost of implementing the Rule if it were finalized in its proposed form.*
- c. *Identify and produce any analysis that Big Rivers has carried out or reviewed of the impact on residential and industrial customers' rates of implementing the Proposed GHG Rule if it were to be finalized in its proposed form.*
- d. *Identify and produce any evaluation that Big Rivers has carried out or reviewed of the cost and/or technological feasibility of bringing the Wilson plant into compliance with the BSER standards set forth in the Proposed GHG Rule.*
- e. *Identify and produce any evaluation that Big Rivers has carried out or reviewed of the cost and/or technological feasibility of bringing the approximately 635 MW natural gas combined cycle plant included in the IRP Base Case with the BSER standards set forth in the Proposed GHG Rule.*

RESPONSE:

a. Included as an attachment to this response are comments provided to EPA on August 8, 2023, by the National Rural Electric Cooperative Association (NRECA). NRECA is comprised of 900 not-for-profit electric cooperatives and other rural electric utilities, including Big Rivers.

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b. Big Rivers has not conducted a formal analysis of the potential amount or timing of costs to comply with EPA's proposed greenhouse gas rule. As stated in the 2023 IRP, EPA is currently working on evaluating over one million comments received on the proposed greenhouse gas rule, with the main impetus of the comments focused on the theme that neither carbon capture and sequestration/storage (CCS) nor Green hydrogen co-firing is currently commercially available or affordable. Big Rivers considers a cost analysis study premature until better and more definitive information becomes available on the viability of the aforementioned control technologies.

c. Please see comments provided in subparts a. and b., above.

d. Please see comments provided in subparts a. and b., above.

e. Please see comments provided in subparts a. and b., above.

Witness: Michael S. Mizell

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REQUEST NO. 1-61: *Refer to Big Rivers' 2022 Annual Report, which states at page 11 that: "This past year brought new successes as the Big Rivers System Average Interruption Duration Index (SAIDI) hit 3.02 for the entire transmission system, equating to about three minutes of Member outage time in 2022. The Meade County RECC region SAIDI score was even more remarkable, with zero outage minutes for the year."*

- a. *Explain how that statement is consistent with the 2022 data reported in the Energy Information Administration's Annual Electric Power Industry Report, Form EIA-861, which shows 2022 SAIDI values of 385.11 minutes for Kenergy Corp., 145.345 minutes for Jackson Purchase Energy Corporation, and 142.306 minutes for Meade County Rural E.C.C.*

- b. *Identify the projected SAIDI and System Average Interruption Frequency Index (SAIFI) values for each of Kenergy, Jackson Purchase, and Meade County Rural E.C.C. for each of the years 2023 through 2038, and produce any analysis supporting such projections.*

RESPONSE:

- a. The SAIDI values referenced in the Big Rivers 2022 Annual Report consider only customer outage minutes associated with transmission outages. SAIDI values reported by distribution cooperatives include customer outage minutes that result from distribution system outages.

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- b. While goals are established for the upcoming year, projected SAIDI and SAIFI values are not calculated by Big Rivers.

Witness: Christopher S. Bradley

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REQUEST NO. 1-62: *Refer to page 12 of Big Rivers' 2022 Annual Report.*

*Identify the projected values for each of the following for each of the years 2023 through 2038
for which a projection exists:*

- a. Long-term debt*
- b. Line of credit*
- c. Margins for Interest Ratio (MFIR)*
- d. Times Interest Earned Ratio (TIER)*
- e. Debt Service Coverage Ratio (DSCR)*

RESPONSE: Please see the attachment to this response for Big Rivers' projected Long-Term Debt, Outstanding Line of Credit, MFIR, TIER, and DSCR for the years 2023 through 2037. Any excess net margin above that necessary to meet a 1.30 MFIR/TIER is assumed to be allocated to 60% to retiring the regulatory assets and 40% returned to Members via bill credit, per PSC Order in Case No. 2020-00064.¹

Big Rivers' current Long-Term Financial Forecast covers the 15-year period ending December 31, 2037. As a result, projections for year 2038 are not currently available.

Witness: Talina R. Mathews

¹ See *In the Matter of: Electronic Application of Big Rivers Electric Corporation for Approval to Modify Its MRSM Tariff, Cease Deferring Depreciation Expenses, Establish Regulatory Assets, Amortize Regulatory Assets, and Other Appropriate Relief*, Case No. 2020-00064, Order (June 25, 2020).

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REQUEST NO. 1-63: *Please refer to page 11 of Big Rivers' 2022 Annual Report, where the Company states that it received "1,848 MW or 15 Crypto Currency Project REFI's in 2022."*

- a. Please produce copies of the "15 Crypto Currency Project REFI's" that are referenced in the 2022 Annual Report.*
- b. For each of the 15 referenced projects, please identify:*
 - i. The name of the company proposing the cryptocurrency facility;*
 - ii. The proposed location of the facility;*
 - iii. The proposed capacity need of the facility;*
 - iv. The proposed firm capacity need of the facility;*
 - v. The anticipated load factor of the facility; and*
 - vi. The current status of the project, i.e., was the proposed facility constructed, is it still under development, are there any ongoing discussions between the project proponent and the Company, or is the project no longer under active consideration.*
- c. Has Big Rivers received any "REFI's" for cryptocurrency projects in 2023? If yes, please produce copies of the REFI's and identify for each project the information requested above in paragraph (b).*

RESPONSE: Big Rivers objects to this request as overly broad and unduly burdensome. Big Rivers further objects because this request seeks irrelevant or inappropriate information, as

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well as proprietary information of third parties that are not parties to this proceeding. Subject to these objections, Big Rivers responds:

- a. See Attachment 1 to this response.
- b. See Attachment 1 to this response.
- c. Yes, see Attachment 2 to this response.

Projects are classified and maintained under project names to protect third parties.

Witness: Nathaniel A. Berry

For the Objection(s): Counsel

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REQUEST NO. 1-64: *How many Big Rivers customers primarily heat their homes using electric heating? Please provide any available analyses or workpapers to support your answer.*

- a. Of the customers primarily heating their home with electric heating, please further specify what type of electric heating is used by the customer, such as boiler, furnace, heat pump, electric resistance, unit heater, or infrared. Please provide any available analyses or workpapers that support your answer.*
- b. Has the Company considered specifically targeting energy efficiency measures toward customers who primarily heat their homes with electric resistance heating?*
 - i. If yes, please explain how the Company has considered this and provide copies of any workpapers or other documents that support your answer.*
 - ii. If not, please explain in detail why not.*

RESPONSE: Big Rivers objects that the term “customers” is unduly vague and ambiguous. Without waiving this objection, Big Rivers states that it construes this term to refer to residential members of the distribution cooperatives that are Member-Owners of Big Rivers. Based on the 2022 Big Rivers end-use survey, the percent of customers whose main home heating fuel is electricity equals 52.78%. Multiplying this percentage by the total system number of residential customers (101,692, as of end of year 2022) equals 53,673.

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Main fuel source for heating home	# of residential consumers on system	Consumer estimate for each selection
Electricity		
52.78%	101,692	53,673

a. From the 2022 Big Rivers end-use survey, the percent of residential customers whose main home heating fuel is electricity, by type of electric heating system, is provided in the table below. The total system number of residential customers (101,692, as of end of year 2022) is multiplied by the electric heating percent, and then by the type of electric heating to arrive at values for each of the sub-categories.

Main fuel source for heating home	Type of electric heating equipment used	# of residential consumers on system	Consumer estimate for each selection
Electricity	Standard heat pump		
52.78%	44.07%	101,692	23,654
Electricity	Dual fuel heat pump		
52.78%	4.19%	101,692	2,249
Electricity	Electric central furnace		
52.78%	34.56%	101,692	18,549
Electricity	Electric baseboard		
52.78%	1.62%	101,692	870
Electricity	Radiant heat		
52.78%	1.93%	101,692	1,036
Electricity	Ground / water source heat pump		
52.78%	2.86%	101,692	1,535
Electricity	Electric Thermal Storage (ETS)		
52.78%	0.48%	101,692	258
Electricity	Ductless HVAC / Mini-Split Heat Pump		
52.78%	2.41%	101,692	1,294

Note that the table above excludes the answer “Other/Unsure” (which constituted 8% of the survey responses) from the type of heating equipment used.

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b. Big Rivers is not specifically targeting energy efficiency measures toward residential customers who primarily heat their homes with electric resistance heating.

(i) Not applicable.

(ii) Residential customers are eligible for assistance through the U.S. Department of Energy's Weatherization Assistance Program (WAP). WAP enables low-income families to lower their energy bills by making their homes more energy efficient. It is Big Rivers' experience that Community Action Agencies in Kentucky are highly effective at providing assistance to residential customers in need of energy efficiency through weatherization funding from DOE and/or LIHEAP.

Witnesses: Joshua Hoyt, CEA (primary and part a)

Russell L. Pogue (part b)

For the Objection(s): Counsel

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REQUEST NO. 1-65: *How many Big Rivers customers live in manufactured housing? Please provide any available analyses or workpapers to support your answer.*

- a. Has the Company considered specifically targeting energy efficiency measures toward customers who live in manufactured housing?*
- i. If yes, please explain how the Company has considered this and provide copies of any workpapers or other documents that support your answer.*
- ii. If not, please explain in detail why not.*

RESPONSE: Big Rivers objects that the term "customers" is unduly vague and ambiguous. Without waiving this objection, Big Rivers states that it construes this term to refer to residential members of the distribution cooperatives that are Member-Owners of Big Rivers. Based on the 2022 Big Rivers end-use survey, there are an estimated 17,766 customers considered to live in "manufactured homes." This calculation was made by multiplying the total system number of residential customers (101,692, as of end of year 2022) by the 17.47% of those customers who identified their housing type as "Manufactured home, mobile home or trailer."

- a. Big Rivers is not targeting energy efficiency measures specifically toward customers who live in manufactured housing.*
- i. Not applicable.*

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ii. Residential customers are eligible for assistance through the U.S. Department of Energy's Weatherization Assistance Program (WAP). WAP enables low-income families to lower their energy bills by making their homes more energy efficient. It is Big Rivers' experience that Community Action Agencies in Kentucky are highly effective at providing assistance to residential customers in need of energy efficiency through weatherization funding from DOE and/or LIHEAP.

Witness: Russell L. Pogue

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REQUEST NO. 1-66: *Refer to page 166 of the IRP. With regards to MISO's*

coordinated short-term and long-term transmission planning processes:

- a. Describe in detail in what ways Big Rivers has participated in the referenced MISO transmission planning processes over the past five years.*
- b. Identify and produce any comments that Big Rivers has submitted in the referenced MISO transmission planning processes over the past five years.*
- c. Identify and produce any studies or analyses that Big Rivers has carried out over the past five years as part of its participation in the referenced MISO transmission planning processes.*

RESPONSE:

a. Big Rivers has participated by submitting projects for inclusion in the MISO Transmission Expansion Plan (MTEP), by reviewing and updating modeling data, and through the review of MISO study reports.

b. Projects and modeling information are submitted through the MISO portal and modeling tool. Specific comments that may have been provided to MISO have not been tracked or logged.

c. While Big Rivers has performed informal studies or analyses to validate MISO results, and supported all MISO data requests, no specific documents or reports can be shared by Big Rivers as part of our participation in the MISO planning process pursuant to Critical Energy Infrastructure Information non-disclosure agreements (CEII NDAs). MISO public reports can be

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accessed on the MISO website at <https://www.misoenergy.org/planning/transmission-planning/mtep#t=10&p=0&s=&sd=>.

Witness: Christopher S. Bradley

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REQUEST NO. 1-67: *Refer to pages 166-167 of the IRP.*

- a. *Identify and produce Big Rivers most recent assessment of “its transmission system’s ability to transfer power into and out of Big Rivers’ local balancing area.”*
- b. *Identify and produce any studies or other analyses supporting the statement that “a simultaneous net import capability of approximately 900 MW is expected.”*
- c. *State whether Big Rivers has evaluated steps that it could take to increase its net import capability. If so, describe the results, and produce any documentation of, such evaluation. If not, please explain why not.*

RESPONSE:

a. Since joining MISO in 2010 and operating as a local balancing area within the MISO BA, the ability to transfer power into and out of the Big Rivers system has been assessed through various studies that include multiple generation dispatch scenarios. This includes MISO MTEP studies (available at misoenergy.org), MISO Coordinated Seasonal Assessments (CEII and not publicly available), SERC Reliability Assessments (a public version is available at SERC1.org), and the Big Rivers Construction Work Plan (see response to Sierra Club Request No. 1-19, subpart a).

b. MISO’s Summer Coordinated Seasonal Assessment (CSA) study included a Big Rivers model with a base import into the Big Rivers system of 924 MW. No Big Rivers transmission issues were identified within this assessment. This report is considered CEII and is not publicly available.

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c. No Big Rivers transmission constraints have been identified in studies performed by Big Rivers, MISO, or SERC. These studies have included various generator outage scenarios. No specific need to increase the net import capability has been identified.

Witness: Christopher S. Bradley

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I, Christopher Bradley, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Name Christopher Bradley
Title Vice President System Operations
Company Big Rivers Electric Corporation

STATE OF Kentucky)
) ss:
COUNTY OF Daviess)

SUBSCRIBED AND SWORN TO before me by Christopher Bradley on this the 3
day of JANUARY, 2024.

My commission expires: 1-14-2026


Notary Public

Notary ID: KYNP43026

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I, Talina R. Mathews, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Talina R. Mathews
Chief Financial Officer
Big Rivers Electric Corporation

STATE OF KENTUCKY)
) ss:
COUNTY OF DAVIESS)

SUBSCRIBED AND SWORN TO before me by Talina R. Mathews on this the
2nd day of January, 2024.

My commission expires: October 31, 2024


Notary Public

Notary ID: KYNP16841

IN THE MATTER OF
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I, Michael S. Mizell, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Michael S. Mizell
Chief Administrative Officer
Big Rivers Electric Corporation

STATE OF KENTUCKY)
) ss:
COUNTY OF DAVIESS)

SUBSCRIBED AND SWORN TO before me by Michael S. Mizell on this the
3 day of JANUARY, 2024.

My commission expires: 1-14-2026



Notary Public

Notary ID: KYNP43026

IN THE MATTER OF
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I, Erin M. Murphy, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.

Erin M. Murphy
Vice President, Federal & RTO Reg. Affairs
Big Rivers Electric Corporation

STATE OF Kentucky)
) ss:
COUNTY OF Daviess)

SUBSCRIBED AND SWORN TO before me by Erin M. Murphy on this the 3 day of JANUARY, 2024.

My commission expires: 1-14-2026


Notary Public

Notary ID: KYNP 43026

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I, Nathaniel A. Berry, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.




Name *Nathaniel A. Berry*
Title *Chief Operating officer*
Company *Big Rivers Electric*

STATE OF KENTUCKY)
) ss:
COUNTY OF DAVIESS)

SUBSCRIBED AND SWORN TO before me by Nathaniel A. Berry on this the 3 day of JANUARY, 2024.

My commission expires: 1-14-2026

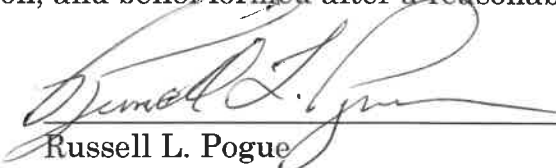


Notary Public
Notary ID: KYNP43026

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I, Russell L. Pogue, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Russell L. Pogue
Manager Power Marketing
and Member Relations
Big Rivers Electric Corporation

STATE OF KENTUCKY)
) ss:
COUNTY OF DAVIESS)

SUBSCRIBED AND SWORN TO before me by Russell L. Pogue on this the 3 day of JANUARY, 2024.

My commission expires: 1-14-2026



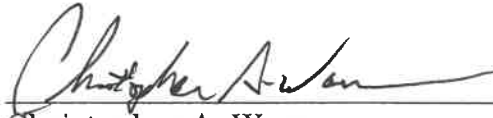
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COMMONWEALTH AND KENTUCKY RESOURCE COUNCIL'S
FIRST REQUEST FOR INFORMATION

I, Christopher A. Warren, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



Christopher A. Warren
Executive Director of Budgeting, Planning,
and Forecasting
Big Rivers Electric Corporation

STATE OF KENTUCKY)
) ss:
COUNTY OF DAVIESS)

SUBSCRIBED AND SWORN TO before me by Christopher A. Warren on this
the 2nd day of January, 2024.

My commission expires: October 31, 2024



Notary Public

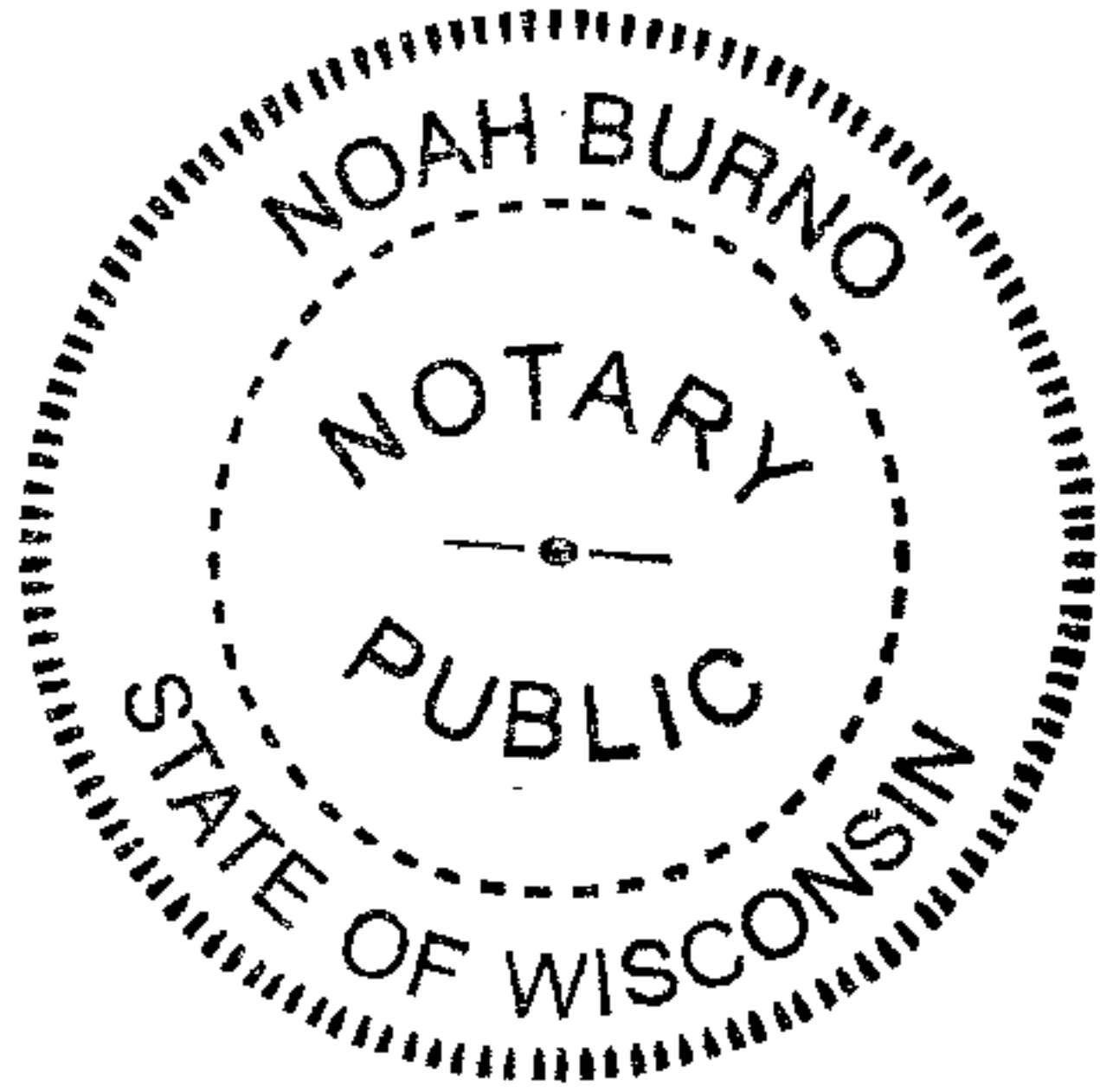
Notary ID: KYNP16841



IN THE MATTER OF
ELECTRONIC 2023 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2023-00310

BIG RIVERS ELECTRIC CORPORATION'S RESPONSES TO KENTUCKIANS FOR THE
COMMONWEALTH AND KENTUCKY RESOURCE COUNCIL'S
FIRST REQUEST FOR INFORMATION

I, Steven A. Fenrick, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



A handwritten signature of Steven A. Fenrick in black ink, written over a horizontal line.

Steven A. Fenrick
Principal Consultant
Clearspring Energy Advisors, LLC

STATE OF Wisconsin)

) ss:

COUNTY OF Dane)

SUBSCRIBED AND SWORN TO before me by Steven A. Fenrick on this the 5th day of January, 2024.

My commission expires: 02/09/2026

A handwritten signature of Noah Burno in black ink, written over a horizontal line.

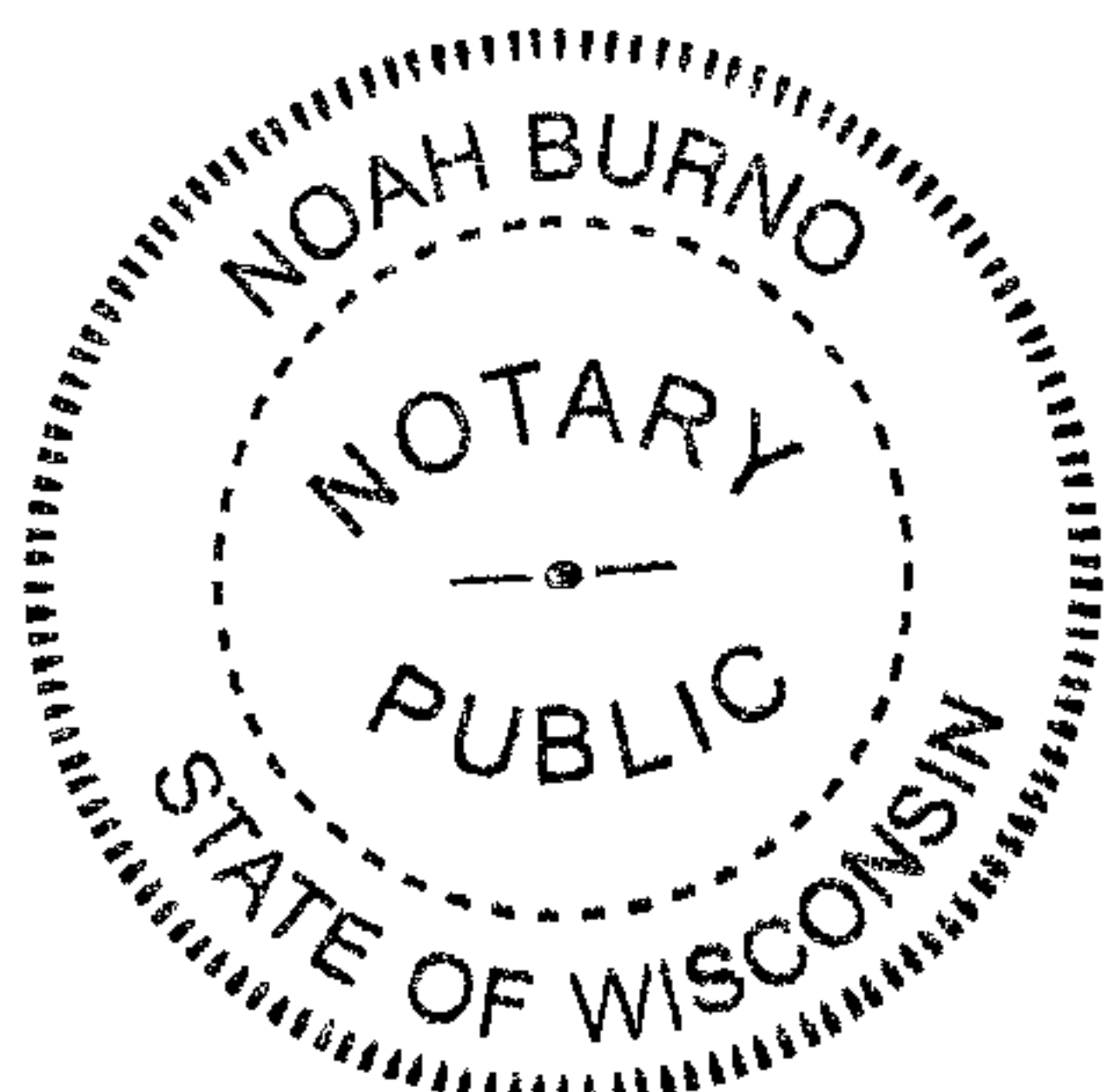
Notary Public

Notary ID: _____

IN THE MATTER OF
ELECTRONIC 2023 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2023-00310

BIG RIVERS ELECTRIC CORPORATION'S RESPONSES TO KENTUCKIANS FOR THE
COMMONWEALTH AND KENTUCKY RESOURCE COUNCIL'S
FIRST REQUEST FOR INFORMATION

I, Joshua P. Hoyt, verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



A handwritten signature in black ink, appearing to read "Joshua P. Hoyt", written over a horizontal line.

Joshua P. Hoyt
Principal Consultant
Clearspring Energy Advisors, LLC

STATE OF Wisconsin)

) ss:

COUNTY OF Dane)

SUBSCRIBED AND SWORN TO before me by Joshua P. Hoyt on this the 5th day of January, 2024.

My commission expires: 2/9/26

A handwritten signature in black ink, appearing to read "Noah Burno", written over a horizontal line.


Notary Public

Notary ID: _____

IN THE MATTER OF
ELECTRONIC 2023 INTEGRATED RESOURCE PLAN OF
BIG RIVERS ELECTRIC CORPORATION
CASE NO. 2023-00310

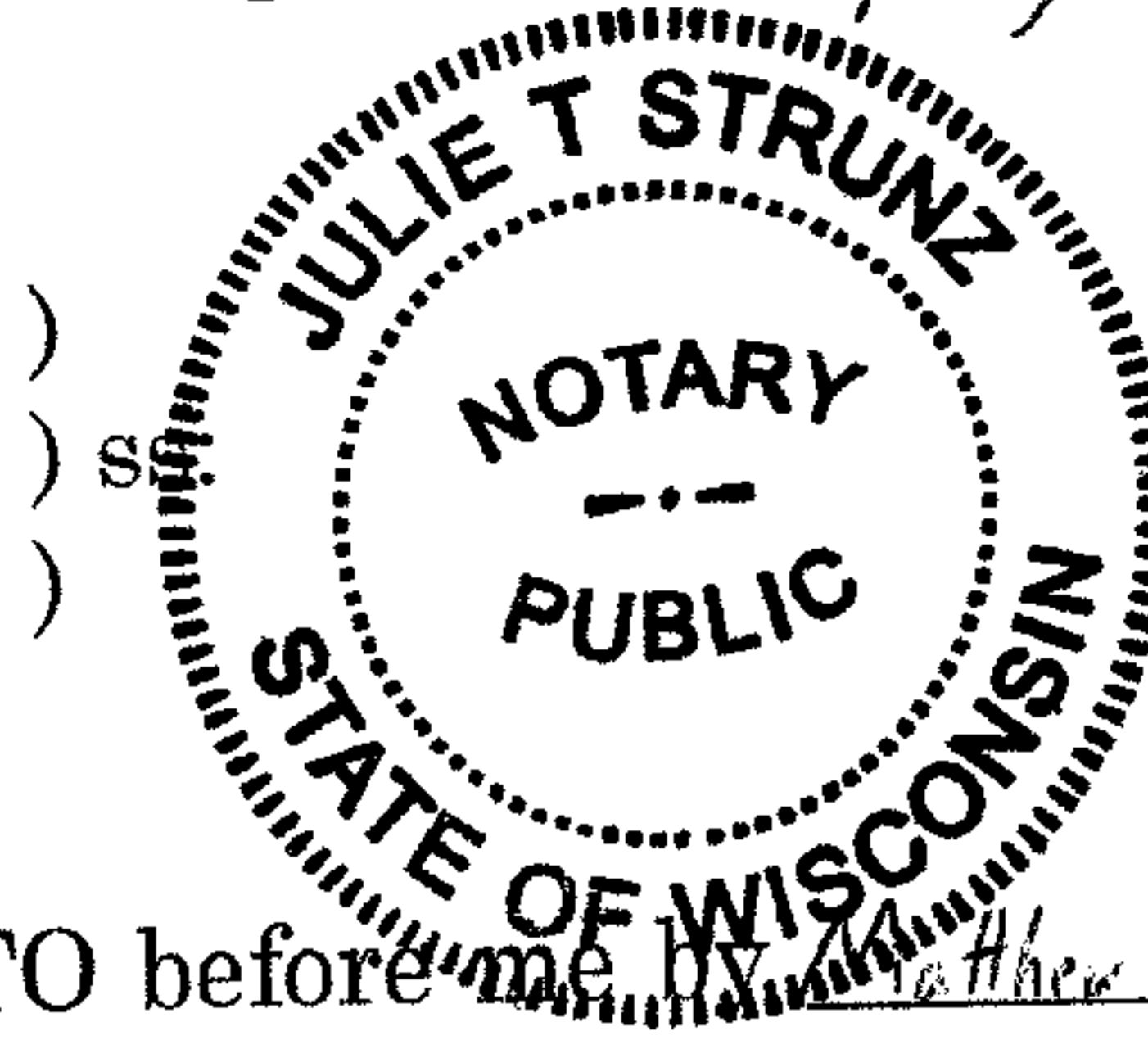
BIG RIVERS ELECTRIC CORPORATION'S RESPONSES TO KENTUCKIANS FOR THE
COMMONWEALTH AND KENTUCKY RESOURCE COUNCIL'S
FIRST REQUEST FOR INFORMATION

I, [Matthew Sekeres], verify, state, and affirm that the information request responses filed with this verification for which I am listed as a witness are true and accurate to the best of my knowledge, information, and belief formed after a reasonable inquiry.



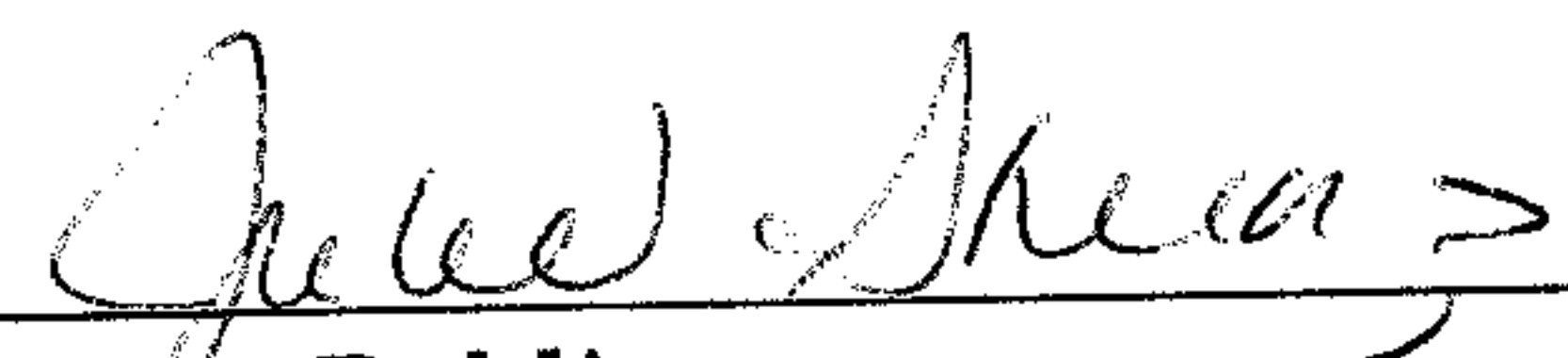
Name *Matthew Sekeres*
Title *Vice President*
Company *Clearspring Energy Advisors*

STATE OF *Wisconsin*
COUNTY OF *Rock*



SUBSCRIBED AND SWORN TO before me by *Matthew Sekeres* on this the 3
day of January, 2024.

My commission expires: 1/21/27


Notary Public

Notary ID: _____