

Exhibit No.:  
Issues: Revenue Requirement  
Witness: Nicholas L. Phillips  
Type of Exhibit: Direct Testimony  
Sponsoring Parties: Ag Processing Inc; Federal Executive Agencies; Midwest Energy Consumer's Group; Midwest Energy Users' Association; and Missouri Industrial Energy Consumers

Case No.: ER-2012-0175  
Date Testimony Prepared: August 9, 2012

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

\_\_\_\_\_  
**In the Matter of KCP&L Greater Missouri  
Operations Company's Request for  
Authority to Implement a General Rate  
Increase for Electric Service**  
\_\_\_\_\_

)  
)  
) **Case No. ER-2012-0175**  
) Tracking No. YE-2012-0405  
)  
)

Direct Testimony and Schedules of

**Nicholas L. Phillips**

On behalf of

**Ag Processing Inc  
Federal Executive Agencies  
Midwest Energy Consumer's Group  
Midwest Energy Users' Association  
Missouri Industrial Energy Consumers**

**NON-PROPRIETARY VERSION**

August 9, 2012





**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

<b>In the Matter of KCP&amp;L Greater Missouri Operations Company’s Request for Authority to Implement a General Rate Increase for Electric Service</b>	) ) ) ) ) )	<b>Case No. ER-2012-0175</b> Tracking No. YE-2012-0405
---	----------------------------	---

**Table of Contents to the  
Direct Testimony of Nicholas L. Phillips**

I. INTRODUCTION ..... 1

II. FUEL EXPENSE, PURCHASED  
POWER EXPENSE AND OFF-SYSTEM SALES ..... 3

III. CONCLUSIONS AND RECOMMENDATIONS..... 7

Appendix A: Qualifications of Nicholas L. Phillips

Appendix B: Benchmarking RealTime to the  
Kansas City Power & Light MIDAS Production Cost Model

Schedule NLP-1 through Schedule NLP-2

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

<hr/>	)	
<b>In the Matter of KCP&amp;L Greater Missouri</b>	)	
<b>Operations Company's Request for</b>	)	<b>Case No. ER-2012-0175</b>
<b>Authority to Implement a General Rate</b>	)	Tracking No. YE-2012-0405
<b>Increase for Electric Service</b>	)	
<hr/>	)	

**Direct Testimony of Nicholas L. Phillips**

**I. INTRODUCTION**

1

2     **Q     PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3     A     Nicholas L. Phillips. My business address is 16690 Swingley Ridge Road, Suite 140,

4            Chesterfield, MO 63017.

5     **Q     WHAT IS YOUR OCCUPATION?**

6     A     I am an Associate Consultant with the firm Brubaker & Associates, Inc., energy,

7            economic and regulatory consultants.

8     **Q     PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.**

9     A     This information is included in Appendix A to this testimony.

10    **Q     HAVE YOU PREVIOUSLY FILED TESTIMONY BEFORE THE MISSOURI PUBLIC**

11        **SERVICE COMMISSION ("COMMISSION")?**

12    A     Yes. I have filed direct testimony with the Commission concerning electric utility fuel

13        costs and off-system sales ("OSS") revenues in Ameren Missouri Case

14        No. ER-2012-0166 and Kansas City Power & Light Case No. ER-2012-0174. I have

Nicholas L. Phillips  
Page 1

1 also previously performed analysis of electric utility fuel costs and OSS revenues  
2 under the direction and supervision of my colleague, James R. Dauphinais, for his  
3 testimony in Ameren Missouri Case Nos. ER-2011-0028 and ER-2010-0036.

4 **Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?**

5 A This testimony is presented on behalf of Ag Processing Inc; Federal Executive  
6 Agencies; Midwest Energy Consumer's Group; Midwest Energy Users' Association;  
7 and Missouri Industrial Energy Consumers (collective referred to as "Industrials").  
8 These companies purchase substantial amounts of electricity from KCP&L Greater  
9 Missouri Operations Company ("GMO" or "Company") and the outcome of this  
10 proceeding will have an impact on their cost of electricity.

11 **Q WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

12 A My testimony addresses the level of native load fuel and purchased power expense,  
13 and off-system sales that GMO proposes to include in its base rate revenue  
14 requirement. Specifically, I address the Iatan Unit 2 forced outage rate assumption  
15 used by GMO in its fuel expense, purchased power expense, and off-system sales  
16 estimate.

17 The fact that I do not address a particular issue should not be construed as an  
18 approval of any position taken by GMO.

19 **Q PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.**

20 A I recommend that the Missouri Public Service Commission ("Commission") reduce  
21 GMO's proposed base rate level of fuel expense, purchased power expense, and

**Nicholas L. Phillips**  
**Page 2**

1 off-system sales by \$0.581 million to correct for the unreasonable forced outage rate  
2 assumption GMO used for Iatan Unit 2.

3 **II. FUEL EXPENSE, PURCHASED**  
4 **POWER EXPENSE AND OFF-SYSTEM SALES**

5 **Q PLEASE EXPLAIN THE TERM NATIVE LOAD FUEL AND PURCHASED POWER**  
6 **EXPENSE.**

7 A GMO's fuel expense, purchased power expense, and off-system sales consists of  
8 GMO's total fuel and purchased power costs for native load and off-system energy  
9 sales less off-system energy sales revenues, as estimated using production cost  
10 modeling.

11 **Q HOW SHOULD THE COMMISSION SET THE FUEL AND PURCHASED POWER**  
12 **EXPENSE COMPONENT OF GMO'S REVENUE REQUIREMENT?**

13 A It should be set on the same basis as the remainder of GMO's revenue requirement.  
14 Specifically, it should be set in this proceeding based on GMO's actual costs during  
15 the historic test year ending September 30, 2011 adjusted as necessary for known  
16 and measurable changes from the true-up period that ends August 31, 2012 and  
17 normalized to address abnormalities such as annual swings in weather and  
18 commodity market prices.

19 **Q PLEASE DESCRIBE YOUR REVIEW OF GMO'S PROPOSED LEVEL OF NATIVE**  
20 **LOAD FUEL AND PURCHASED POWER EXPENSE.**

21 A I reviewed the direct testimony and schedules of GMO witnesses Crawford and Blunk  
22 concerning GMO's proposed fuel expense, purchased power expense, and

1 off-system sales. I also reviewed GMO's response to data requests in this  
2 proceeding that relate to the issue. As discussed in Appendix B of this testimony, BAI  
3 developed a production cost model database for the GMO system using the  
4 RealTime production cost software of The Emelar Group. This production cost model  
5 database allowed BAI to use the RealTime production cost software to calculate the  
6 estimated impact on fuel expense, purchase power expense, and off-system sales  
7 from updating and correcting the inputs GMO used in its own MIDAS production cost  
8 model. Finally, I applied my experience to the information available in considering the  
9 reasonableness of GMO's proposed level of fuel expense, and purchased power  
10 expense, and off-system sales.

11 **Q PLEASE DESCRIBE THE REALTIME PRODUCTION COST MODEL AND HOW**  
12 **YOU HAVE USED IT IN THIS PROCEEDING.**

13 A RealTime is a production cost software package similar in purpose and application to  
14 the MIDAS production cost software package used by GMO. It is a product of The  
15 Emelar Group. Both RealTime and MIDAS are competent models for estimating  
16 utility production cost

17 The Commission Staff has been using the RealTime software for over  
18 10 years for electrical corporations over which the Commission has ratemaking  
19 jurisdiction. It is my understanding that the Commission Staff used the RealTime  
20 software in GMO's last two general electric rate proceedings in order to examine the  
21 reasonableness of GMO's projections for its fuel expense and purchased power  
22 expense.

23 I have used the RealTime software in this proceeding to estimate how GMO's  
24 proposed level of fuel expense, purchased power expense, and off-system sales will

**Nicholas L. Phillips**  
**Page 4**

1 change when I update and correct certain assumptions made by GMO. It is my  
2 understanding that the Commission Staff is again intending to use the RealTime  
3 software in this proceeding.

4 **Q WHAT HAS BEEN DONE IN THIS PROCEEDING TO ENSURE THE REALTIME**  
5 **MODEL PROVIDES RESULTS SIMILAR TO THOSE THAT WOULD BE PROVIDED**  
6 **BY THE MIDAS MODEL?**

7 A We implemented a RealTime model database for this proceeding using the same  
8 inputs that GMO used in its MIDAS model runs to determine normalized test year fuel  
9 expense, purchased power expense and off-system sales. This RealTime case,  
10 which I will refer to as the “BAI Benchmark Case,” projected a native load fuel and  
11 purchased power expense within \$0.446 million of the fuel and purchased power  
12 expense projected by GMO in its MIDAS run for the normalized test year in this  
13 proceeding. Appendix B to this testimony provides a more detailed discussion on the  
14 development of the BAI Benchmark Case and how its estimate of fuel expense,  
15 purchased power expense, and off-system sales compare to that of GMO’s MIDAS  
16 run for the normalized test year.

17 **Q HAVE YOU IDENTIFIED ANY INPUTS IN GMO’S MIDAS MODEL OF NATIVE**  
18 **LOAD FUEL AND PURCHASED POWER EXPENSE THAT YOU BELIEVE ARE**  
19 **UNREASONABLE?**

20 A While I continue to review these inputs and will review the direct testimony of other  
21 parties in this proceeding with regard to this issue, I have so far identified one  
22 concern. Specifically, GMO’s Equivalent Forced Outage Rate (“EFOR”) assumption



1 for the Iatan Unit 2 generation facility is unreasonably high. This understates the  
2 generating unit's historical availability when not down for scheduled outages.

3 **Q WHAT IS MEANT BY EFOR ASSUMPTION?**

4 A EFOR is the hours of unit failure (unplanned outage hours and equivalent unplanned  
5 derated hours) given as a percentage of the total hours of the availability of that unit  
6 (unplanned outage, unplanned derated, and service hours). These rates are then  
7 used as an input to a production cost model, which will simulate random outages for  
8 each unit to determine the target number of hours a generating unit will be forced out  
9 of service.

10 **Q WHAT FORCED OUTAGE RATE DO YOU RECOMMEND USING AT IATAN UNIT**  
11 **2?**

12 A I recommend using a forced outage rate of 5.5% as opposed to the 10.5% rate  
13 assumed by the Company.

14 **Q PLEASE EXPLAIN HOW YOU DEVELOPED THE EFOR RECOMMENDATION**  
15 **FOR IATAN UNIT 2.**

16 A Using NERC GADS<sup>1</sup> data, I calculated the EFOR for Iatan Unit 2 with data beginning  
17 on January 1, 2011 through December 31, 2011, which is the first calendar year of  
18 operation for Iatan Unit 2. In 2011, Iatan Unit 2 experienced an EFOR of 5.5%. I  
19 then compared the calculated value to the 2006-2010 five-year average of similarly  
20 sized (800-999 MW) coal-fired generators reporting into the NERC GADS of 4.53%  
21 and conservatively selected the higher of the two values. I would note that the

---

<sup>1</sup>NERC GADS is the main source of power station outage data in North America and is used by analysts industry-wide in numerous applications.

1 2006-2010 average is the most current data published on the NERC website at the  
2 time of writing this testimony.

3 **Q HAVE YOU RERUN YOUR PRODUCTION COST MODEL FOR THE NORMALIZED**  
4 **TEST YEAR USING THE UPDATED FORCED OUTAGE RATE YOU HAVE**  
5 **RECOMMENDED?**

6 A Yes. The result is a net \$0.581 million decrease in GMO's proposed native load fuel  
7 and purchased power expense. This is documented in my Schedule NLP-1. Please  
8 refer to the direct testimony of my colleague, Greg R. Meyer, for an allocation of this  
9 adjustment between the two operating jurisdictions of GMO.

10 **III. CONCLUSIONS AND RECOMMENDATIONS**

11 **Q PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.**

12 A I recommend that the Commission reduce GMO's proposed base rate level of fuel  
13 expense, purchased power expense, and off-system sales by \$0.581 million to  
14 correct for the unreasonable forced outage rate assumption GMO used for Iatan Unit  
15 2.

16 **Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

17 A Yes.

## Qualifications of Nicholas L. Phillips

1    **Q     PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2    A     Nicholas L. Phillips. My business address is 16690 Swingley Ridge Road, Suite 140,  
3        Chesterfield, MO 63017.

4    **Q     PLEASE STATE YOUR OCCUPATION.**

5    A     I am an Associate Consultant with the firm of Brubaker & Associates, Inc. ("BAI"),  
6        energy, economic and regulatory consultants.

7    **Q     PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL  
8        EMPLOYMENT EXPERIENCE.**

9    A     I graduated from the Washington University in St. Louis/University of Missouri-St.  
10       Louis joint engineering program in 2010 where I received a Bachelor of Science  
11       degree in Electrical Engineering. I joined BAI as an intern in 2009 and upon  
12       graduation, I accepted a position with BAI as an Associate Engineer. In January of  
13       2012, I was promoted to the position of Associate Consultant. At BAI, I have been  
14       involved with numerous regulated and competitive electric service issues. These  
15       have included transmission planning, resource planning, electric price forecasting,  
16       load forecasting, cost of service, combined heat and power steam costs and power  
17       procurement. This has involved the performance of power flow, production cost,  
18       transmission line routing, cost of service and other analysis to address these issues.  
19       I am currently working toward a Master of Engineering in Electrical Engineering (with  
20       an emphasis in Power Systems Engineering) through Iowa State University's  
21       Engineering Distance Education Program. At this time I have completed 80% of my

**Nicholas L. Phillips**  
**Appendix A**  
**Page 1**

1 degree requirements. My completed coursework includes classes in Power & Energy  
2 System Planning, Power System Operation & Control (Steady State Analysis),  
3 Economic Systems for Electric Power Planning, Power System Dynamics,  
4 Electromechanical Wind Energy Conversion & Grid Integration, Nuclear Engineering  
5 & Radiation Theory, Reliability, and Linear System Theory.

6 Topics covered by these classes include but are not limited to Economic  
7 Dispatch, Unit Commitment, Production Cost Modeling, Capacity Expansion  
8 Planning, Transmission Planning, Power Flow Analysis, Security Constrained Optimal  
9 Power Flow, Transient and Dynamic Stability, Wholesale Electricity Markets, Nuclear  
10 Energy, Reliability Studies as well as experience with PLEXOS, an industry leading  
11 combined production cost and capacity/transmission expansion model. Additionally,  
12 MISO professionals presented a series of nine lectures discussing their approach to  
13 the planning process and use of production costing, capacity/transmission expansion  
14 planning, and other software including PSS/E, PROMOD IV, Strategist, MARS, and  
15 EGEAS. I am a member of the Institute of Electrical and Electronics Engineers. Prior  
16 to joining BAI, through the department of Electrical and Computer Engineering and  
17 the Medical School at Washington University in St. Louis, I aided in preliminary  
18 research focusing on the use of ultrasound as a mechanism for in vitro localized  
19 thermometry.

20 BAI was formed in April 1995. BAI and its predecessor firm have participated  
21 in more than 700 regulatory proceedings in 40 states and Canada.

22 BAI provides consulting services in the economic, technical, accounting, and  
23 financial aspects of public utility rates and in the acquisition of utility and energy  
24 services through RFPs and negotiations, in both regulated and unregulated markets.  
25 Our clients include large industrial and institutional customers, some utilities and, on

**Nicholas L. Phillips**  
**Appendix A**  
**Page 2**

1 occasion, state regulatory agencies. We also prepare special studies and reports,  
2 forecasts, surveys and siting studies, and present seminars on utility-related issues.

3 In general, we are engaged in energy and regulatory consulting, economic  
4 analysis and contract negotiation. In addition to our main office in St. Louis, the firm  
5 also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

## Appendix B

### **Benchmarking RealTime to the Kansas City Power & Light MIDAS Production Cost Model**

1 Q PLEASE EXPLAIN HOW BAI DEVELOPED ITS “BAI BENCHMARK CASE” THAT  
2 WAS USED TO COMPARE THE RESULTS OF THE EMELAR GROUP REALTIME  
3 PRODUCTION COST SIMULATION MODEL TO THE RESULTS OF THE MIDAS  
4 PRODUCTION COST SIMULATION MODEL.

5 A We started with the inputs GMO used in its production cost model. We then used  
6 these inputs to create a database to as closely as possible match the inputs that  
7 GMO used in its direct testimony normalized test year MIDAS run.

8 Q CAN YOU PLEASE DETAIL HOW THE RESULTS OF THE BAI BENCHMARK  
9 CASE COMPARES TO THE MIDAS PRODUCTION COST MODEL RUN  
10 PERFORMED BY GMO?

11 A Yes. As detailed in Schedule NLP-1, the results of the BAI Benchmark Case yielded  
12 a native load fuel and purchased power expense of \*\*\* versus the  
13 \*\*\* fuel expense, purchased power expense, and off-system sales  
14 yielded from the GMO normalized test year MIDAS production cost simulation model  
15 run. Thus, in aggregate, the BAI Benchmark Case results are within approximately  
16 \$446,000 or 0.24% of the GMO normalized test year MIDAS run. In addition, as also  
17 detailed in Schedule NLP-2, the annual MWh of energy production at GMO’s coal  
18 stations in the BAI Benchmark Case is within  $\pm 0.4\%$  of the levels that are in GMO’s  
19 normalized test year MIDAS run. Furthermore, annual MWh generated by gas-fired  
20 generation is within 1.1%, annual volumes of non-firm energy purchases are within

NP  
Nicholas L. Phillips  
Appendix B  
Page 1

1 1.4% and annual volumes of non-firm energy sales are within 2.4%. However, this  
2 difference does not have a significant impact on predicting fuel expense, purchased  
3 power expense, and off-system sales since fuel expense, purchased power expense  
4 and off-system sales, in the aggregate, is within  $\pm 0.24\%$  and coal station MWh  
5 production is all within  $\pm 0.4\%$ .

6 **Q WHAT DO YOU CONCLUDE REGARDING THE BENCHMARKING ANALYSIS OF**  
7 **REALTIME PERFORMED BY BAI UNDER YOUR DIRECTION AND**  
8 **SUPERVISION?**

9 A When utilizing the same inputs as GMO, the RealTime program provides native load  
10 fuel and purchased power expense results nearly identical to those of the MIDAS  
11 program used by GMO. As such, RealTime can be reasonably utilized to calculate  
12 the impact that changes to the input assumptions used by GMO will have on GMO's  
13 native load fuel and purchased power expense.

\\Doc\Shares\ProlawDocs\MED\9594\Testimony-BAI\222944.doc

**Nicholas L. Phillips**  
**Appendix B**  
**Page 2**

# Non-Proprietary

## Kansas City Power & Light - Greater Missouri Operations

Case No. ER-2012-0175

### Production Cost Modeling (Fuel Expense, Purchased Power Expense, and Off-System Sales) Adjustments Proposed by Industrials

	<u>Increase/(Decrease)</u> <u>vs. BAI Benchmark</u>	<u>Net Fuel Cost</u>	<u>Gross Fuel Cost</u>	<u>OSS Revenues</u>	<u>Coal Fuel Cost</u>	<u>Natural Gas and Oil</u> <u>Cost</u>	<u>Purchased Power</u> <u>Cost</u>
GMO MIDAS Case-in-Chief	(\$445,618)						
BAI Benchmark	\$ -						
BAI Adjustment 1 - Iatan 2 EFOR	(\$581,360)						

	<u>Native Load</u> <u>MWh</u>	<u>Gross MWh</u>	<u>OSS MWh</u>	<u>Coal MWh</u>	<u>CT and GT MWh</u>	<u>Purchased Power</u> <u>MWh</u>
GMO MIDAS Case-in-Chief						
BAI Benchmark						
BAI Adjustment 1 - Iatan 2 EFOR						

Notes:

Gross is summation of all coal, gas, oil, and purchased power (both spot and firm)

Net is the difference of gross and off system sales



**Non-Proprietary**  
**Kansas City Power & Light - Greater Missouri Operations**  
**Case No. ER-2012-0175**  
**Comparison of BAI Benchmark Case to GMO Normalized Test Year Production Cost Run**  
**All Numbers in MWh**

		January	February	March	April	May	June	July	August	September	October	November	December	Total	Percent Difference BAI vs. MIDAS
Jeffery Energy Center	MIDAS														-3.0%
	BAI														
	MIDAS-BAI														
Sibley	MIDAS														0.1%
	BAI														
	MIDAS-BAI														
Iatan	MIDAS														0.1%
	BAI														
	MIDAS-BAI														
Lake Road 4	MIDAS														1.2%
	BAI														
	MIDAS-BAI														
Oil CT	MIDAS														0.0%
	BAI														
	MIDAS-BAI														
Natural Gas - Steam & CT	MIDAS														-1.1%
	BAI														
	MIDAS-BAI														
Coal	MIDAS														-0.4%
	BAI														
	MIDAS-BAI														
Sales	MIDAS														-2.2%
	BAI														
	MIDAS-BAI														
Purchases	MIDAS														0.9%
	BAI														
	MIDAS-BAI														
GMO Generation	MIDAS														-0.4%
	BAI														
	MIDAS-BAI														
Net	MIDAS														0.0%
	BAI														
	MIDAS-BAI														

Source:  
MIDAS data received as workpaper to Burton Crawford's Direct Testimony in Case No. ER-2012-0175. Filename "GMO TestYear COS FI - HC.xlsx"