



proposed modification to Commonwealth Edison's ("ComEd") Procurement Plan ("Procurement Plan" or "Plan"), to increase the forward contract quantities procured in order to eliminate spot market purchases throughout the summer and during on-peak non-summer periods,<sup>1</sup> is unsupported, and that implementation of such a proposal could have unnecessary and undesirable effects on customer prices. As part of this explanation, I rebut claims made by and analysis performed by Robert F. McCullough in his most recent affidavit filed by the AG as AG Exhibit 2.0.<sup>2</sup> Third, I explain why the rationale for the AG's proposed modification to conduct the RFP for forward contracts in March and April 2008 is flawed. Fourth, I address the claim made by Mr. McCullough that ComEd has focused its procurement plan on the point estimate of loads.<sup>3</sup>

### **Forward and Spot Price Comparison**

4. In its Procurement Plan, ComEd proposed to purchase forward contracts ("forwards") in order to hedge customers' financial exposure associated with the energy that will be required during the June 2008 – May 2009 period that is not already covered by pre-existing contracts. A forward contract requires the buyer to pay the seller an agreed-upon fixed "forward price" for a specified amount of electricity to be delivered<sup>4</sup> at a specified time in the future.<sup>5</sup> As

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<sup>1</sup> Supplemental Comments by the People of the State of Illinois In Opposition to Proposed Procurement Plans and Tariffs, at 2.

<sup>2</sup> It should be noted that nothing in my affidavit should be interpreted as an endorsement of any of the underlying assumptions made by or the calculations performed by Mr. McCullough.

<sup>3</sup> AG Exhibit 2.0, at paragraphs 11-20.

<sup>4</sup> The term "delivered" is used here and is appropriate for physically-settled forward contracts. While the term "settled" is more appropriate for financially-settled forward contracts, use of the term "delivered" is more intuitive and will be used throughout this affidavit.

<sup>5</sup> As noted in the Plan, forward contracts can be structured to settle physically or financially. A financial contract involves a payment from the seller to the buyer if the market price in the future is greater than the forward price, and involves a payment from the buyer to the seller if the market price in the future is less than the forward price. The payment is based on the

opposed to purchasing the commodity at the future market price, a buyer of a forward receives a net benefit if the future market price is higher than the agreed-upon forward price or incurs a net loss if the future market price is less than the agreed-upon forward price. Purchasing forwards is a useful hedging strategy for an entity such as ComEd because its customers are exposed to uncertainty regarding future market prices in the June 2008 – May 2009 period.

5. Agreed-upon forward prices are strongly tied to expectations about future market prices. The logic supporting this fact is simple. If a potential seller's forward price offer were noticeably higher than expected future market prices, then potential buyers would purchase forwards from competing sellers at a lower price. Similarly, if a potential buyer's forward price bid were noticeably lower than expected future market prices, then potential sellers would sell forwards to competing buyers at a higher price.<sup>6</sup>

6. Analysis of actual market data indicates that there is no clear systematic difference between forward prices and expected spot prices for energy delivered in Northern Illinois. Specifically, I have compared forward prices for delivery over given periods to the average spot prices over the same periods. I have performed several analyses of this nature, and these analyses do not indicate any clear systematic difference between forward prices and spot prices.

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difference between the market price and the forward price. While a buyer of a forward that settles financially does not actually pay the seller the full forward price, the economics are the same as if the buyer did. That is, purchasing the energy at the forward price and selling it at the market price is the same as receiving the difference between the market price and the forward price (or paying this difference if it is negative).

<sup>6</sup> It should be noted that some potential buyers may be willing to pay a premium in order to ensure that the forward is purchased to hedge financial exposure. Similarly, some potential sellers may be willing to accept a discount in order to ensure that the forward is sold to hedge financial exposure. As demonstrated in this affidavit, actual market evidence relevant to energy deliveries in Northern Illinois indicates that forward prices approximate expected spot prices, suggesting that any willingness on behalf of buyers to pay a premium is compensated by a willingness on behalf of sellers to accept a discount, and vice-versa.

7. In my first analysis, I compared on-peak forward prices quoted at the end of each month for delivery throughout the following month with the average spot prices during the same on-peak delivery periods. In other words, I measured the percentage difference between the forward price for delivery in May 2004 (as quoted at the end of April 2004) and the average spot price for May 2004, I measured the percentage difference between the forward price for delivery in June 2004 (as quoted at the end of May 2004) and the average spot price for June 2004, etc. The forward prices used in the analysis are those published in *Megawatt Daily*<sup>7</sup> for delivery at the Northern Illinois Hub (“NiHub”),<sup>8</sup> the closest trading hub to ComEd. The spot prices used in the analysis are the real-time locational marginal prices (“LMPs”) at NiHub.<sup>9</sup> The analysis included all months extending back to May 2004, the first month in which ComEd was part of PJM. The following graph shows the results of this analysis:

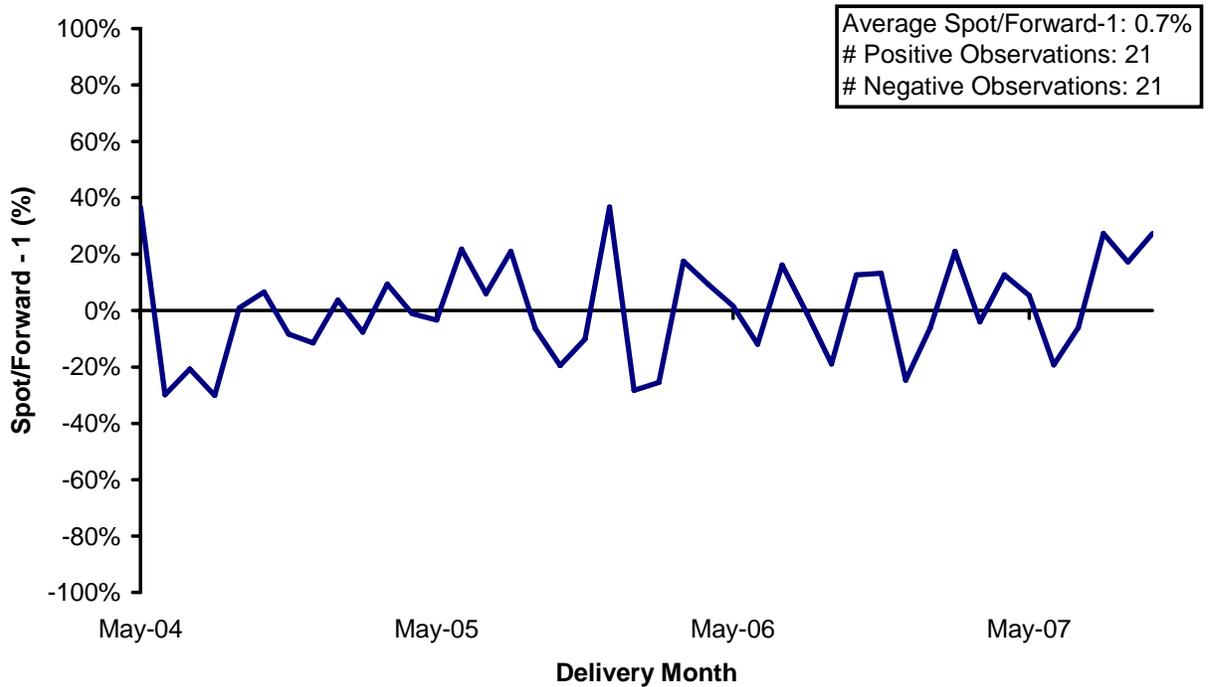
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<sup>7</sup> Forward prices reported by *Megawatt Daily* were used instead of forward prices reported by NYMEX because forward prices reported by *Megawatt Daily* have been reported for a longer period of time. It should be noted that the results are roughly the same for consistent time periods regardless of whether forward prices reported by *Megawatt Daily* or NYMEX are used.

<sup>8</sup> The forward price quoted at the end of April 2004 for delivery in May 2004 is for delivery to “ComEd, Into.”

<sup>9</sup> All real-time price data used in my analyses was compiled by *Energy Velocity*.

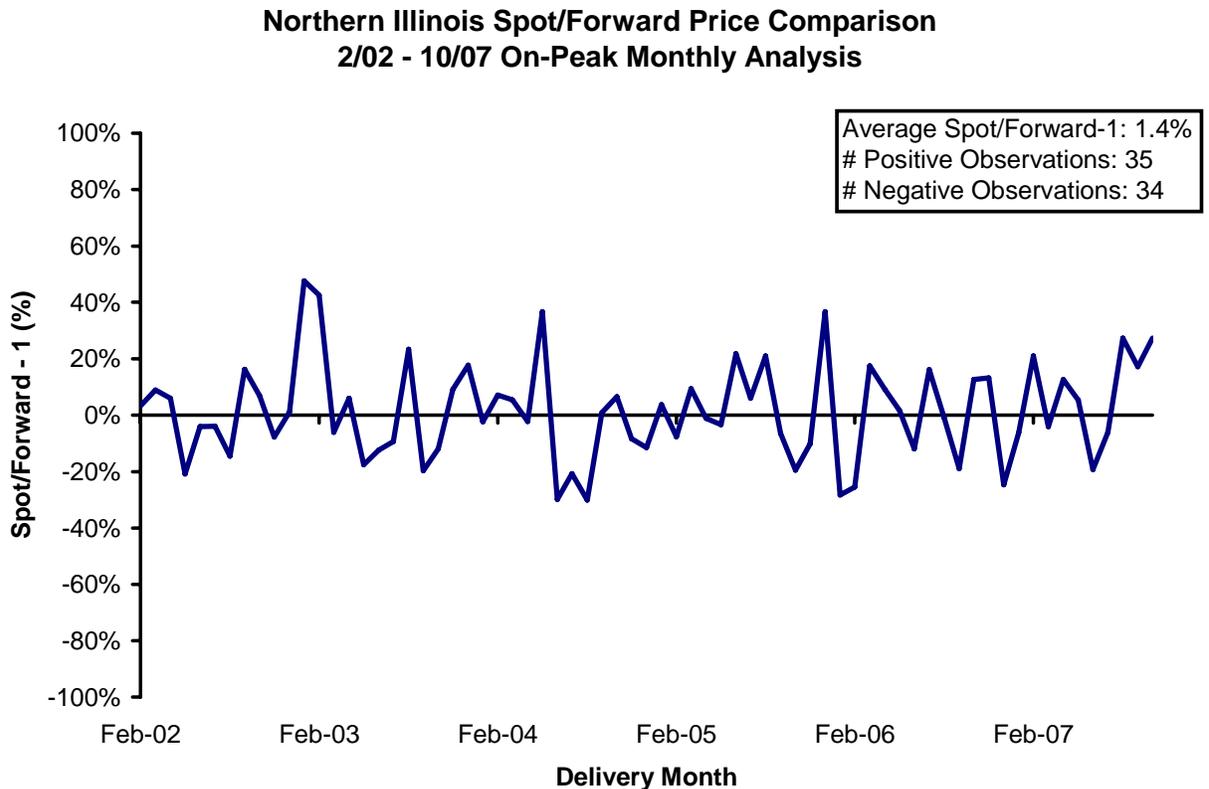
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8. In the graph, a positive percentage indicates that the average spot price was greater than the forward price corresponding to the same delivery period. A negative percentage indicates the opposite, that the forward price was greater than the average spot price. As the graph shows, of the 42 months studied, the forward price was higher than the spot price in exactly half of these months and the spot price was higher than the forward price in exactly half of these months. On average, the difference between forward prices and spot prices has been 0.7% (on average, the average spot price has been 0.7% greater than the average forward price).

9. For my second analysis, I extended the first analysis back before May 2004 when ComEd joined PJM, to February 2002, the first month for which forward prices were available

for energy delivered in Northern Illinois.<sup>10</sup> Day-ahead on-peak prices published by Megawatt Daily were used to estimate the average on-peak spot price for months prior to May 2004 because applicable real-time LMPs did not exist before ComEd joined PJM.<sup>11</sup> The following graph shows the results of this analysis:



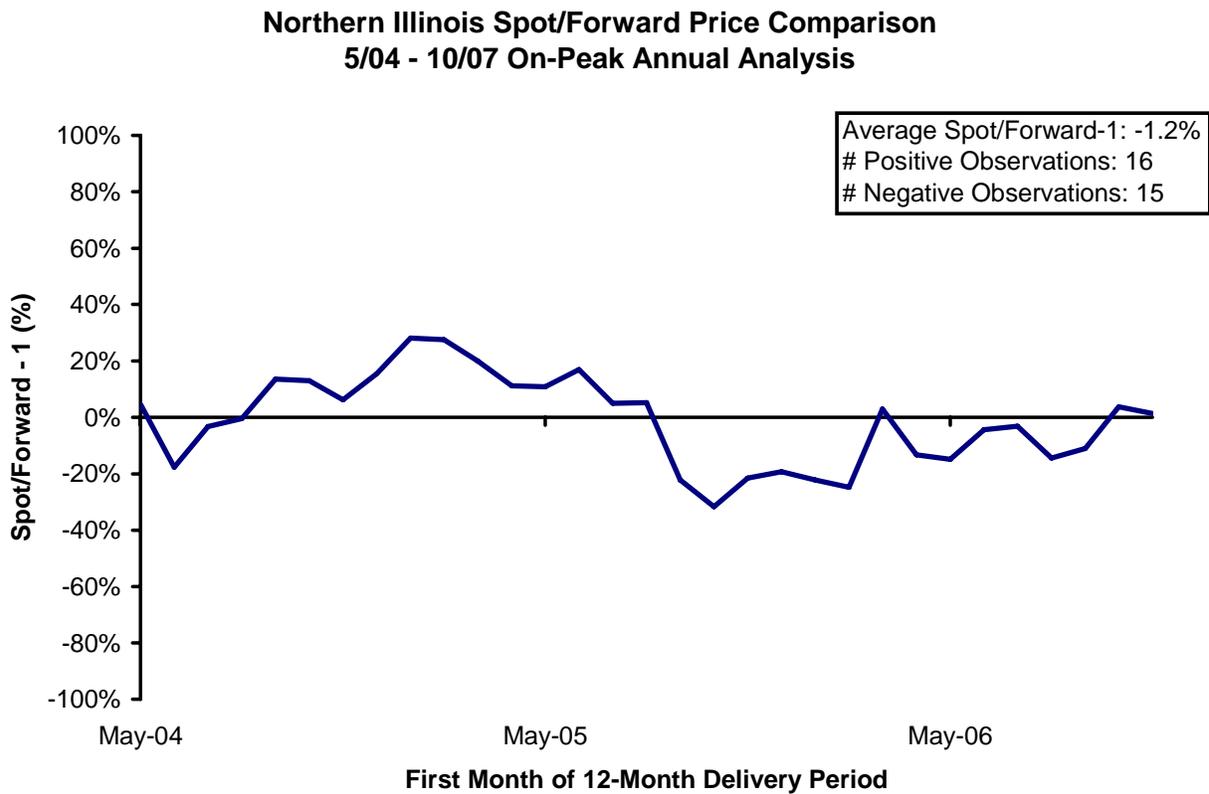
10. As the graph shows, of the 69 months studied, in 35 months the average spot price was higher than the forward price and in 34 months the average spot price was lower than the forward price. On average, the difference between forward prices and spot prices has been 1.4% (on average, the average spot price has been 1.4% greater than the average forward price).

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<sup>10</sup> For trade dates before May 2004, the forward prices were for delivery to “ComEd, Into.”

<sup>11</sup> These day-ahead prices were for delivery to “ComEd, Into.”

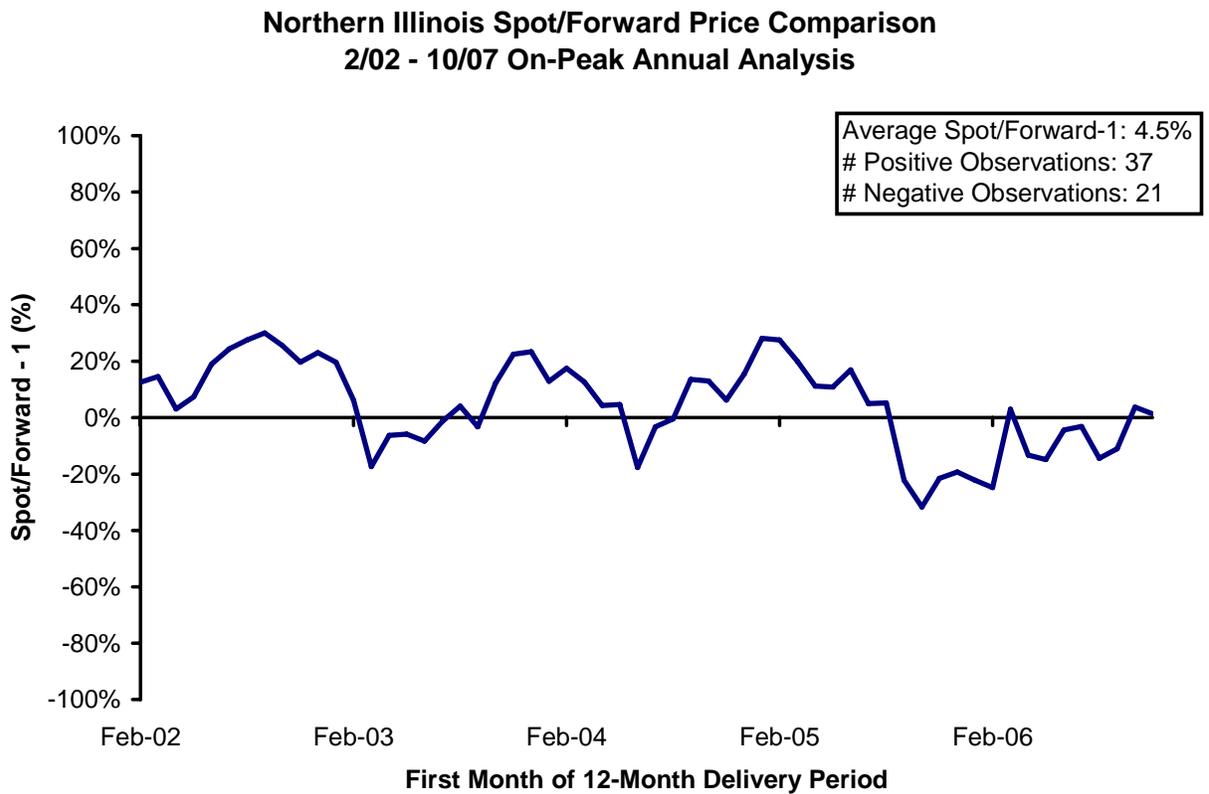
11. For my third analysis, I studied the same period studied in the first analysis (May 2004 – October 2007), except I studied the on-peak forward price quoted at the end of each month for delivery throughout the following 12 months, and compared these forward prices with the average spot prices during the same on-peak delivery period. The following graph shows the results of this analysis:



12. The percentage differences between forward and spot prices are correlated with each other because the 12-month delivery periods overlap. In other words, if the spot/forward price percentage attributable to a given twelve-month period is positive, then the percentage attributable to the next twelve-month period is more likely to be positive. As a result, the graph above portrays a smoother trend than the graphs associated with monthly delivery periods (which do not include overlapping periods). As the graph shows, of the 31 12-month periods studied, in

16 of these periods the average spot price was higher than the forward price and in 15 of these periods the average spot price was lower than the forward price. On average, the difference between forward prices and spot prices has been -1.2% (on average, the average spot price has been 1.2% less than the average forward price).

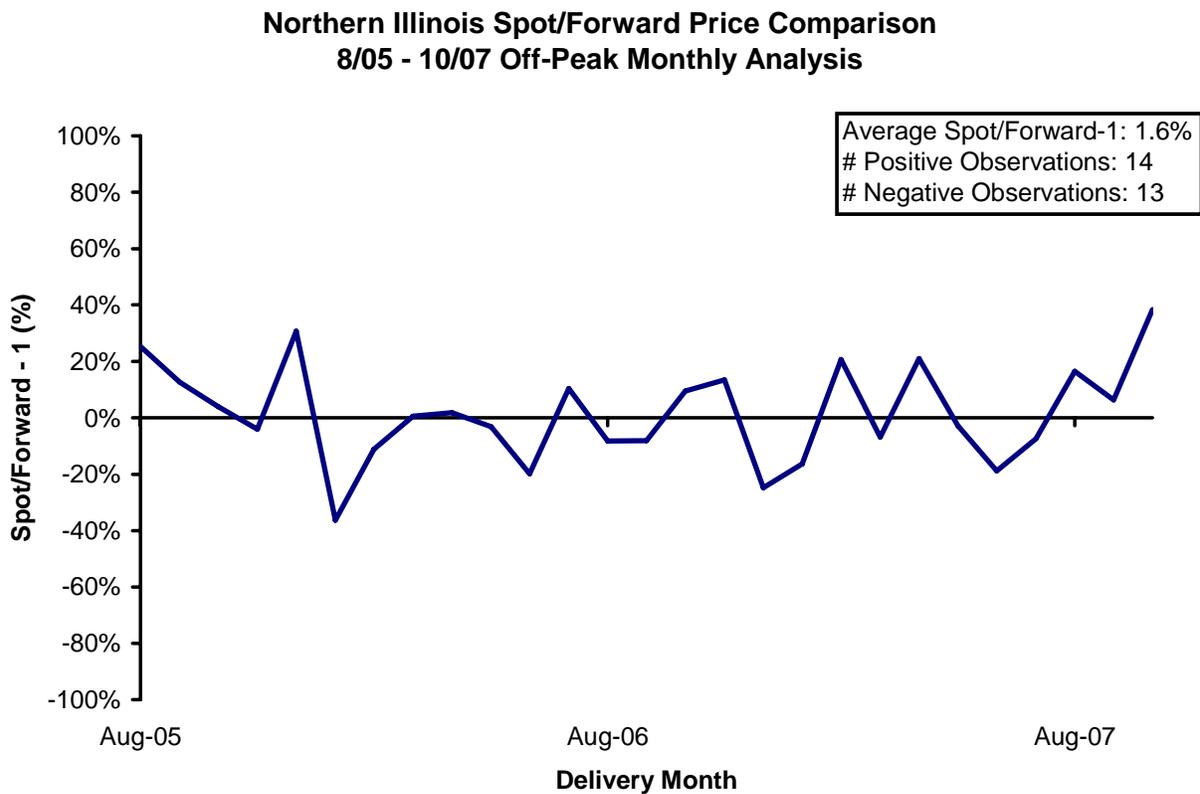
13. For my fourth analysis, I extended the third analysis back before May 2004 when ComEd joined PJM, to February 2002, the first month for which forward prices were available for energy delivered in Northern Illinois. The following graph shows the results of this analysis:



14. As the graph shows, of the 58 12-month periods studied, in 37 of these periods the average spot price was higher than the forward price and in 21 of these periods the average spot price was lower than the forward price. On average, the difference between forward prices and

spot prices has been 4.5% (on average, the average spot price has been 4.5% greater than the average forward price).

15. For my fifth analysis, I studied off-peak prices. I was unable to use Megawatt Daily for this analysis because Megawatt Daily does not report applicable off-peak prices. Instead, I used off-peak forward prices reported by NYMEX.<sup>12</sup> Unfortunately, there is less historical data available for the off-peak period. As a result, my analysis of off-peak prices is more limited than my analysis of on-peak prices. The analysis included all delivery months beginning with August 2005. The following graph shows the results of this analysis:



<sup>12</sup> All NYMEX forward price data used in my analyses was compiled by *Energy Velocity*.

16. As the graph shows, of the 27 months studied, in 14 months the average spot price was higher than the forward price and in 13 months the average spot price was lower than the forward price. On average, the difference between forward prices and spot prices has been 1.6% (on average, the average spot price has been 1.6% greater than the average forward price).

17. The following table summarizes my analyses of the differences between forward prices and spot prices:

<b>Analysis</b>	<b>Average Spot/Forward-1</b>	<b># Positive Observations</b>	<b># Negative Observations</b>
5/04-10/07 On-Peak Monthly	0.7%	21	21
2/02-10/07 On-Peak Monthly	1.4%	35	34
5/04-10/07 On-Peak Annual	-1.2%	16	15
2/02-10/07 On-Peak Annual	4.5%	37	21
8/05-10/07 Off-Peak Monthly	1.6%	14	13

18. As the table shows, at times the average spot price has been greater than the forward price and at times the average spot price has been less than the forward price, but on average, forward prices have approximated spot prices. Consequently, the actual market evidence indicates that there is no clear systematic difference between forward prices and spot prices for energy in Northern Illinois.

19. While Mr. McCullough (on behalf of the AG) reaches a different conclusion regarding the costs of hedging<sup>13</sup> than ComEd does based on the analysis that I have presented, it should be noted that my analysis incorporates price data from a historical period that is over twice as long as the period studied by Mr. McCullough.<sup>14</sup> This is important because Mr.

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<sup>13</sup> AG Exhibit 2.0, at paragraphs 2-10.

<sup>14</sup> Mr. McCullough's analysis incorporates price data pertaining to delivery periods as early as February 2005, while my analysis incorporates price data pertaining to delivery periods as early as February 2002.

McCullough appears to caveat the results of his analysis on numerous occasions due to the limited amount of historical data that he used. Furthermore, Mr. McCullough does not hesitate to reject his own results for non-summer off-peak hours when they do not support his beliefs.

20. In his discussion of the cost of hedging, Mr. McCullough asserts, “Forward markets ultimately depend on the presence of speculators who are willing to risk capital in exchange for a risk premium.”<sup>15</sup> This is not true. Forward markets can exist without speculators demanding risk premiums. Some parties may sell forward contracts to reduce their financial exposure, just as some parties may purchase forward contracts to reduce their financial exposure. Examples of parties who can reduce their financial exposure by selling forward contracts include power plant owners with relatively fixed generation costs, and parties who previously purchased forward contracts that have yet to be delivered.

### **Rebuttal to the AG’s Recommendation to Increase Forward Contract Quantities**

21. In its supplemental comments, the AG recommends that ComEd procure forward contracts in quantities that eliminate spot market purchases throughout the summer and during on-peak non-summer periods.<sup>16</sup> This proposal is vague at best, because it does not recommend specific quantities of forward contracts.

22. The AG relies on AG Exhibit 2.0, the second affidavit of Robert F. McCullough,<sup>17</sup> to support its proposed modification. In his affidavit, Mr. McCullough does not

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<sup>15</sup> AG Exhibit 2.0, at paragraph 3.

<sup>16</sup> Supplemental Comments by the People of the State of Illinois In Opposition to Proposed Procurement Plans and Tariffs, at 2.

<sup>17</sup> Supplemental Comments by the People of the State of Illinois In Opposition to Proposed Procurement Plans and Tariffs, at 2.

recommend any specific forward contract quantities, but his analysis implies that the lowest risk for customers occurs if the hedge ratio is 140% for summer on-peak delivery periods, about 125% for summer off-peak delivery periods, 125% for non-summer on-peak delivery periods, and 100% for non-summer off-peak delivery periods.<sup>18</sup> The term “hedge ratio” refers to the megawatt quantity of forward contracts procured divided by the forecasted average megawatt load during the relevant delivery period.

23. It is important to note that the hedge ratios implied by Mr. McCullough’s analysis do not necessarily correspond to the quantities of forward contracts that would need to be procured to eliminate spot market purchases throughout the summer and during on-peak non-summer periods, as proposed by the AG.<sup>19</sup> This fact adds further ambiguity to the AG’s proposal.

24. This is the second attempt by the AG to justify a proposal to significantly increase the quantities of forward contracts to be procured. In the AG’s initial objections to the Plan, the AG made a similarly vague recommendation to increase forward contract quantities so that they “exceed forecasted load during critical peak periods by amounts greater than those proposed by ComEd”<sup>20</sup> The AG relied on the results of an entirely separate analysis by Mr. McCullough to justify this proposal. These results were presented in Mr. McCullough’s first affidavit in this proceeding, which the AG submitted as AG Exhibit 1.0. Mr. McCullough’s analysis in AG

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<sup>18</sup> The 125% value for summer off-peak delivery periods is not identified in Mr. McCullough’s text, but it is the approximate value shown in his graph. AG Exhibit 2.0, at paragraphs 25-32.

<sup>19</sup> Supplemental Comments by the People of the State of Illinois In Opposition to Proposed Procurement Plans and Tariffs, at 2.

<sup>20</sup> Objections and Proposed Modifications to Commonwealth Edison’s Initial Procurement Plan and Tariff and Request For Rehearing By the People of the State of Illinois, at 3.

Exhibit 1.0 indicated that hedge ratios that are different from those which he is now presenting in AG Exhibit 2.0 would minimize risks for customers. In my first affidavit in this proceeding, which was filed by ComEd with its response to parties' initial objections to the Plan, I explained why Mr. McCullough's analysis and conclusions were fatally flawed, and as a result why he provided no evidence that modifying the quantities of forward contracts to be procured from the amounts proposed by ComEd would benefit customers. Neither Mr. McCullough nor the AG addressed the flaws that I identified in Mr. McCullough's first analysis, and unfortunately, Mr. McCullough's second analysis to support the AG's current proposal is riddled with many of the same significant flaws. Therefore, the analysis presented by Mr. McCullough in AG Exhibit 2.0 is invalid and provides no support for the AG's current recommendation.

25. Before I identify the significant technical flaws in Mr. McCullough's analysis, it is important to understand why the logic that Mr. McCullough presents to support the AG's recommendation to significantly increase the forward quantities above proposed levels is nonsensical.<sup>21</sup> Mr. McCullough dedicates two pages of his affidavit to convey the point that there is a positive correlation between loads and market prices.<sup>22</sup> He notes that "periods when loads are high are also periods when prices are high."<sup>23</sup> Mr. McCullough then uses this argument to support his assertion that excess forward contract quantities would be prudent to procure as "insurance against errors in the load forecast during periods of high demand rather than risking

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<sup>21</sup> Nothing in my affidavits should be interpreted to imply that procurement of forward contract quantities approximately reflective of forecasted loads is always the preferred approach. Different circumstances in the future may warrant different approaches and/or quantities.

<sup>22</sup> AG Exhibit 2.0, at paragraphs 12-16.

<sup>23</sup> AG Exhibit 2.0, at paragraph 12.

purchases in the spot market...”<sup>24</sup> While I do not intend to imply that Mr. McCullough’s use of the term “insurance” should be interpreted as a claim by Mr. McCullough that forward contracts are exactly the same as insurance products, Mr. McCullough’s statement and use of the term “insurance” is misleading and helps to illustrate why his logic for purchasing excess quantities of forward contracts is flawed. In important ways, forward contracts are not like insurance, and purchasing greater and greater quantities of forward contracts, as the AG recommends, involves risks that are not associated with excess purchases of insurance, such as disability insurance. Insurance products, such as disability insurance, involve an up-front premium payment from the buyer of the insurance to the seller. After this premium payment is made, there is no downside to the beneficiary of the insurance policy. If a specific type of event occurs, which in the case of disability insurance is a disability, then the buyer will be provided compensation.<sup>25</sup> If the event does not occur, then no additional money will change hands. A forward contract is materially different. Unlike insurance, there is no up-front premium payment, but like insurance the forward contract can provide the buyer with a financial benefit if a certain event occurs such as an increase in spot market prices above the forward price. But, unlike insurance after it is purchased, the forward contract also involves a potential incremental financial loss to the buyer (versus purchasing energy at the spot market price) which would occur if the spot market price drops below the forward price.<sup>26</sup> It is dangerous to underestimate the potential for drops in spot

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<sup>24</sup> AG Exhibit 2.0, at paragraph 28.

<sup>25</sup> In this example, I assume that the buyer of the insurance and the beneficiary are the same person.

<sup>26</sup> In order to help convey his claim that ComEd should purchase excess quantities of forward contracts, Mr. McCullough compares purchasing excess forward contract quantities in order to hedge risks with hugging the side of the road away from the cliff while driving on a mountain road. Mr. McCullough’s use of this analogy is further indication that he has failed to recognize the downside risk associated with the AG’s proposal to significantly increase the quantities of forward contracts to be purchased. As I have explained, there are dangers associated with purchasing quantities that are too little (loads and prices may rise above forecasted levels), just as there are with purchasing quantities that are excessive (loads and prices may

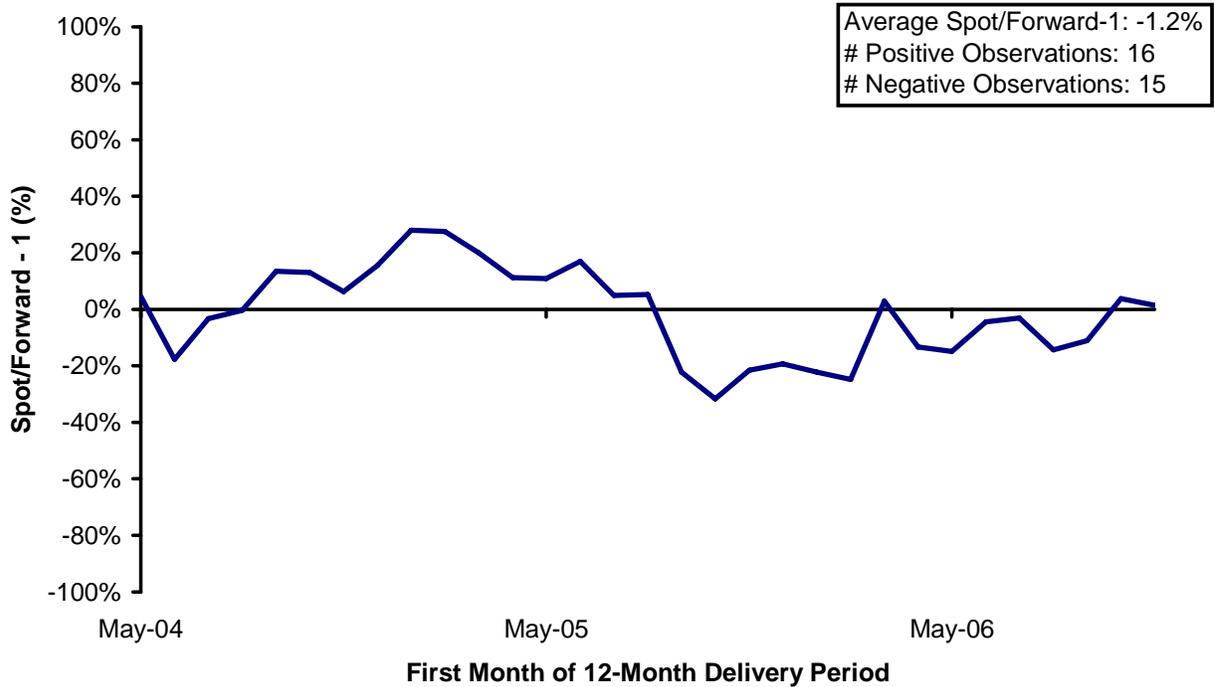
market prices, and hence this downside risk. The average spot price over any given 12-month period can be significantly lower than the forward price for that period, just as it can be significantly higher than the forward price. Graphs which I previously presented in this affidavit depict the percentage differences between forward prices and spot prices for energy in Northern Illinois for 12-month on-peak delivery periods. For example, as the following graph (which I previously presented) shows, since ComEd joined PJM in May 2004, the maximum percentage drop in the 12-month average on-peak spot price<sup>27</sup> across a 12-month delivery period was roughly the same as the maximum percentage increase in the 12-month average on-peak spot price. Specifically, the maximum drop was 31.7%, and the maximum increase was 28.0%.

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fall below forecasted levels). Perhaps a better analogy than the one provided by Mr. McCullough is driving on a road with cliffs on both sides.

<sup>27</sup> Relative to the closing forward price for the same delivery period.

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26. The AG fails to recognize the downside risk and its undesirable effects when it advocates significantly increasing the quantity of forward contracts to be procured above forecasted load levels. While the AG’s proposal is vague at best, the AG has requested “...that the Commission condition approval of the ComEd and Ameren procurement plans on modifications to the plans that would eliminate spot purchases throughout the summer and during on-peak non-summer periods.”<sup>28</sup> The AG’s intent appears to be to reduce customers’ exposure to volatile spot prices by ensuring that forward contracts are purchased in quantities high enough to exceed load in all hours (except possibly the peak hour), but this would actually

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<sup>28</sup> Supplemental Comments by the People of the State of Illinois In Opposition to Proposed Procurement Plans and Tariffs, at 2.

expose customers to the volatile spot prices on all of the excess energy that was procured for hours in which the load did not reach peak hour levels.

27. To further illustrate this risk, I have developed a simple illustrative example. This example shows a sample distribution of customer price outcomes using estimates of loads and market prices derived from actual data presented and discussed in the Procurement Plan.<sup>29</sup> The example indicates that significant increases in the quantities of forward contracts to be procured would subject customers to greater risk.

28. In the example, three scenarios are considered. The first scenario represents a situation in which retained load is lower than expected. The second scenario represents a base case. The third scenario represents a situation in which retained load is higher than expected. These load scenarios correspond to the same load scenarios used in the Risk Assessment section of the Plan.<sup>30</sup>

29. As noted by Mr. McCullough, loads and market prices are generally correlated. The correlation between loads and market prices is accounted for in this example by aligning low prices with low loads, base prices with base loads, and high prices with high loads. The low, base, and high prices were developed using forward prices observed on October 18, 2007, and low, base, and high price factors that were calculated from historical price data for delivery at the Northern Illinois Hub. The forward prices and price factors are the same as those used in the

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<sup>29</sup> While this example is derived from actual data, it has been simplified and is intended to be illustrative.

<sup>30</sup> Specifically, the low load scenario assumes low retention and low usage, the base load scenario assumes base retention and usage, and the high load scenario assumes high retention and high usage. Procurement Plan, at 51. For the purposes of this illustrative example, it is assumed that block forward contracts will be procured at 10/18/07 prices to hedge all retained load requirements. In other words, the existing SFC contracts are ignored.

Risk Assessment section of the Plan.<sup>31</sup> The load-weighting gross-ups applied to these prices are the average values used in the Risk Assessment section of the Plan.<sup>32</sup>

30. Assumptions for hedging ratios were required to calculate prices paid by customers. ComEd has proposed procuring quantities of forward contracts reflective of forecasted loads. This is equivalent to a hedge ratio of 100%. Mr. McCullough's analysis implies that several different hedge ratios should be used<sup>33</sup> which, when weighted by forecasted loads, produce a weighted-average hedge ratio of 120%.

31. The table below shows prices that would be paid by customers<sup>34</sup> if the hedge ratio were 100%, as ComEd has proposed. The resulting prices paid by customers in this illustrative example range from \$54.76/MWH to \$58.14/MWH and have a standard deviation of \$1.73/MWH.<sup>35</sup>

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<sup>31</sup> Specifically, the same forward prices are used. Actual spot prices are calculated by applying the "Spot Price vs. RFP Price" factors to the forward prices. The low price factor is equal to .725. The high price factor is equal to 1.308. Procurement Plan, at 43-46.

<sup>32</sup> These estimates are presented on page 49 of the Plan. Procurement Plan, at 48-49.

<sup>33</sup> Mr. McCullough's analysis implies a hedge ratio of 140% for summer on-peak periods, 125% for non-summer on-peak periods, and 100% for non-summer off-peak periods. Mr. McCullough does not refer to any specific hedge ratio for summer off-peak periods, but the graph presented on Page 8 of his affidavit suggests an "optimal" hedge ratio of approximately 125%. AG Exhibit 2.0, at paragraphs 21-32.

<sup>34</sup> In this example, the customer prices do not incorporate certain aspects of customer rates (e.g., capacity costs, ancillary services costs, translation mechanisms, line loss gross-ups, etc.). However, this does not affect the conclusions that can be drawn from this example.

<sup>35</sup> The standard deviation calculation assumes an equal probability of each scenario, which is a reasonable assumption for the purposes of this illustrative example.

	Scenario #1	Scenario #2	Scenario #3	Standard Deviation
Load (MM MWH) [a]	36.8	45.0	53.1	1.73
Average Spot Price (\$/MWH) <sup>36</sup> [b]	37.46	51.68	67.62	
Hourly Load-Weighting Gross-Up <sup>37</sup> [c]	6.0%	6.0%	6.0%	
Unhedged Cost (\$MM) [d]=[a]*[b]*(1+[c])	1,462	2,465	3,806	
Forward Price (\$/MWH)	51.68	51.68	51.68	
Average Spot Price (\$/MWH)	37.46	51.68	67.62	
Contract Cost/(Benefit) (\$/MWH)	14.23	0.00	(15.94)	
Contract Quantity (MM MWH)	45.0	45.0	45.0	
Contract Cost/(Benefit) (\$MM) [e]	640	0	(718)	
Total Cost (\$MM) [f]=[d]+[e]	2,103	2,465	3,088	
Price Paid By Customers (\$/MWH) [e]=[f]/[a]	57.07	54.76	58.14	

32. The table below shows prices that would be paid by customers if the hedge ratio were 120%, which is the weighted-average hedge ratio implied by Mr. McCullough’s analysis. The resulting prices paid by customers in this illustrative example range from \$54.76/MWH to \$60.61/MWH and have a standard deviation of \$3.21/MWH. In addition, the customer price is highest in the low market price scenario.

	Scenario #1	Scenario #2	Scenario #3	Standard Deviation
Load (MM MWH) [a]	36.8	45.0	53.1	3.21
Average Spot Price (\$/MWH) <sup>38</sup> [b]	37.46	51.68	67.62	
Hourly Load-Weighting Gross-Up <sup>39</sup> [c]	6.0%	6.0%	6.0%	
Unhedged Cost (\$MM) [d]=[a]*[b]*(1+[c])	1,462	2,465	3,806	
Forward Price (\$/MWH)	51.68	51.68	51.68	
Average Spot Price (\$/MWH)	37.46	51.68	67.62	
Contract Cost/(Benefit) (\$/MWH)	14.23	0.00	(15.94)	
Contract Quantity (MM MWH)	54.2	54.2	54.2	
Contract Cost/(Benefit) (\$MM) [e]	771	0	(864)	
Total Cost (\$MM) [f]=[d]+[e]	2,233	2,465	2,942	
Price Paid By Customers (\$/MWH) [e]=[f]/[a]	60.61	54.76	55.39	

<sup>36</sup> This price is weighted by the monthly on-peak/off-peak base case forecasted loads.

<sup>37</sup> This is the residual hourly load-weighting gross-up applied to the “Average Spot Price” shown above.

<sup>38</sup> This price is weighted by the monthly on-peak/off-peak base case forecasted loads.

<sup>39</sup> This is the residual hourly load-weighting gross-up applied to the “Average Spot Price” shown above.

33. The difference between the prices paid by customers under the two hedging approaches is a result of the gains and losses on the hedges and the way that these gains and losses are allocated to the retained load. In the low load and market price scenario, both hedging strategies result in losses. In the high load and market price scenario, both hedging strategies result in gains. However, larger gains and losses are generated when a 120% hedge ratio is adopted than when a 100% hedge ratio is adopted. Adopting a 120% hedge ratio is helpful if the high market price scenario occurs because large gains on the forward contracts offset relatively expensive spot energy purchases. However, adopting a 120% hedge ratio is not helpful if the low market price scenario occurs because large losses on the forward contracts offset relatively inexpensive spot energy purchases. Furthermore, adopting a 120% hedge ratio is *especially* unhelpful in the low market price scenario, because the large losses are allocated to a smaller amount of retained load.

34. The example above indicates that significant increases in the quantities of forward contracts to be procured would subject customers to greater risk. Yet, Mr. McCullough's analysis seems to contradict this fact, as his graphs indicate that increasing the hedge ratio from 100% to values between 125% and 140% for much of the year will result in the lowest risk. While I did not have sufficient time to review Mr. McCullough's calculations in detail, it is clear that his analysis is riddled with many of the same significant flaws that were present in his previous analysis presented in AG Exhibit 1.0, and this is the likely reason for his nonsensical results. In my first affidavit in this proceeding, which was filed by ComEd with its response to parties' initial objections to the Plan, I described these flaws in detail. I briefly describe them again:

- a) The mathematical approach that Mr. McCullough employs in his analysis is incorrect. When calculating his recommended forward contract quantities, Mr. McCullough focuses on the variability regarding ComEd's total dollar costs, but does not consider the uncertainty regarding the prices that customers would pay under his recommended procurement portfolio.
- b) Mr. McCullough misapplies historical hourly load and price data in his analysis, and therefore he does not appropriately characterize the relevant future load and market price uncertainty.
- c) Mr. McCullough's measure of risk, which is the standard deviation of outcomes, is not descriptive enough in this case to adequately characterize the risk to which customers are exposed under a given procurement strategy.

35. In conclusion, the AG's proposal to significantly increase the quantities of forward contracts to be procured should be rejected. The AG's proposal is ambiguous, the logic to support it is nonsensical, and the analysis presented to justify it is flawed.

### **Rebuttal to the AG's Justification for Conducting the RFP in March and April**

36. The AG's second recommendation is to hold the RFP for forward contracts in March and April.<sup>40</sup> This recommendation is based on the contention made by Mr. McCullough that it is generally less expensive to purchase forward contracts during "off-peak months" than during "on-peak months."<sup>41</sup> According to Mr. McCullough, this alleged phenomenon is

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<sup>40</sup> Supplemental Comments by the People of the State of Illinois In Opposition to Proposed Procurement Plans and Tariffs, at 3.

<sup>41</sup> AG Exhibit 2.0, at paragraph 33.

commonly known as the “curve shift.”<sup>42</sup> The alleged existence of this phenomenon is unsupported for a number of reasons:

- a) The two documents that Mr. McCullough uses to support the existence of the curve shift phenomenon pertain to a specific situation of market manipulation, in a different geographical region (Western markets) in 2000 and 2001. Neither of these documents addresses the present-day PJM market for energy.
- b) Mr. McCullough presented two scatter-plots in his attempt to show that the curve shift phenomenon is applicable to prices for Northern Illinois. These scatter-plots are designed to portray the relationship between forward prices and spot prices. Despite any claim by Mr. McCullough that these scatter-plots indicate any relationship between his plotted spot and forward prices, no clear relationship can be determined by viewing the scatter-plots, and this lack of a clear relationship is further supported by the very low R-squared values for each of the scatter-plots (0.14 and 0.04).<sup>43,44</sup>
- c) Even Mr. McCullough admits that this alleged phenomenon is not universally accepted, as he acknowledges that it is a “subject of continued debate in the industry.”<sup>45</sup>

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<sup>42</sup> AG Exhibit 2.0, at paragraph 33.

<sup>43</sup> AG Exhibit 2.0, at paragraphs 37-38.

<sup>44</sup> The R-squared value indicates the explanatory power of a regression. It is bounded by 0 and 1. A higher value indicates greater explanatory power.

<sup>45</sup> AG Exhibit 2.0, at paragraph 34.

- d) Even if we assume in the hypothetical that this phenomenon was real, trades made by market participants to take advantage of the opportunities presented by the phenomenon would quickly remove the possibility for arbitrage, and the curve shift would quickly disappear.

**Response to Mr. McCullough's Claim That ComEd Focuses on the Point Estimate of Loads**

37. In his most recent affidavit, Mr. McCullough states that ComEd focused its procurement plan on a point estimate of loads.<sup>46</sup> Contrary to Mr. McCullough's claim, ComEd explicitly addressed load uncertainty on Pages 49-51 of its Plan, and it presented a risk assessment that evaluated customer prices in various well-developed scenarios that reflect load uncertainty associated with both customer retention and usage.<sup>47</sup>

38. This completes my affidavit.

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<sup>46</sup> AG Exhibit 2.0, at paragraphs 11-12.

<sup>47</sup> Procurement Plan, at 42-61.

SUBSCRIBED and sworn to under the pains and penalties of perjury on this 30<sup>th</sup> day of November, 2007.

*Scott G. Fisher*

\_\_\_\_\_  
Scott G. Fisher

COMMONWEALTH OF MASSACHUSETTS

MIDDLESEX, ss.

November 30, 2007

Then personally appeared the above-named Scott G. Fisher, having been duly sworn, who stated the foregoing to be true based on his personal knowledge, and who acknowledged the foregoing to be his free act and deed, before me,

*Patricia Ann B...*  
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Notary Public  
My Commission Expires: June 21, 2013