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May 1, 2015

**VIA ELECTRONIC FILING**

Mr. Daniel P. Wolf  
Executive Secretary  
Minnesota Public Utilities Commission  
121 Seventh Place East, Suite 350  
St. Paul, MN 55101

RE: Reply Comments of Great River Energy  
In the Matter of Great River Energy's 2014 Integrated Resource Plan  
MPUC Docket No. ET2/RP-14-813

Dear Mr. Wolf:

Great River Energy ("GRE") submits these Reply Comments in response to the Minnesota Public Utilities Commission's Notice of Comment Period and in response to the Initial Comments concerning the merits of GRE's Integrated Resource Plan 2015-2029 submitted by the Department of Commerce, Division of Energy Resources; the Minnesota Center for Environmental Advocacy, Fresh Energy, the Izaak Walton League of America, the Sierra Club, and Wind on the Wires; and Al-Corn Clean Fuel / Heartland Corn Products.

If you have any questions about this information please contact me at (763) 445-6103 or [lrossmccalib@greenergy.com](mailto:lrossmccalib@greenergy.com).

Sincerely,

*/s/LAUREEN L. ROSS McCALIB*  
Manager, Resource Planning and Regulatory Affairs  
GREAT RIVER ENERGY

Enclosure

c: Service List

**STATE OF MINNESOTA  
BEFORE THE  
MINNESOTA PUBLIC UTILITIES COMMISSION**

Beverly Jones Heydinger	Chair
Nancy Lange	Commissioner
Dan Lipschultz	Commissioner
John Tuma	Commissioner
Betsy Wergin	Commissioner

In the Matter of Great River Energy's  
2015-2029 Resource Plan

Docket No. ET-2/RP-14-813

**REPLY COMMENTS OF GREAT RIVER ENERGY**

Great River Energy ("GRE") submits these Reply Comments in response to the Minnesota Public Utilities Commission's ("Commission") November 7, 2014 Notice of Comment Period and in response to the Initial Comments concerning the merits of GRE's Integrated Resource Plan 2015-2029 ("IRP") which were filed on March 2, 2015.

GRE filed its IRP on October 31, 2014.<sup>1</sup> On November 7, 2014, the Commission issued a Notice of Comment Period requesting comments on the completeness of GRE's IRP by December 2, 2014 and initial comments on the merits of the plan by March 2, 2015. On March 2, 2015, the Department of Commerce, Division of Energy Resources ("Department"), the Minnesota Center for Environmental Advocacy ("MCEA"), Fresh Energy, the Izaak Walton League of America, the Sierra Club, and Wind on the Wires (collectively "Environmental Intervenors"), GRE's member-owner cooperatives ("Members"), and Al-Corn Clean Fuel/Heartland Corn Products (collectively, "Al-Corn") submitted initial comments on the IRP.

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<sup>1</sup> Docket No. ET2/RP-14-813, GRE IRP Filing dated October 31, 2014 (the "GRE IRP").

These Reply Comments respond to the initial comments received from the Department, the Environmental Intervenors and AI-Corn.

## **I. General**

GRE appreciates the review and comments received from our Members, the Department, and the intervenors. GRE's 2014 IRP is our proposal to reliably and safely meet our members' energy needs in a cost-effective and environmentally responsible way. Since our 2012 IRP, we made changes to our planning process, incorporated the Commission's orders from our 2012 IRP,<sup>2</sup> monitored other IRP proceedings, added solar as a resource option in our modeling, engaged in expanded outreach with external stakeholders and other interested parties, and incorporated calculations of projected CO<sub>2</sub> emission reductions under the 2007 Minnesota Next Generation Energy Act<sup>3</sup> ("NextGen") and the EPA's Clean Power Plan.<sup>4</sup>

Our 2014 IRP proposes a balanced Preferred Plan that provides options and flexibility for our Members over the next 15 years. As detailed in the IRP, our Preferred Plan meets the five factors to consider in an Integrated Resource Plan as set forth in the Minnesota Rules.<sup>5</sup> Our Preferred Plan meets our triple bottom line of affordability, reliability and environmental stewardship, and is supported by our Members as being in their best interest.<sup>6</sup> The Preferred Plan includes a removal of our obligation to purchase 50 percent of the output of Dairyland Power Cooperative's Genoa Unit 3 coal-fired generating facility ("Genoa 3"), adding enough renewable resources to continue to meet the Minnesota Renewable Energy Standard, and

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<sup>2</sup> Docket No. ET2/RP-12-1114, Commission Order dated September 26, 2013.

<sup>3</sup> Minn. Stat. §216H.02, Subd. 1.

<sup>4</sup> "Carbon Pollution Emission Guidelines for Existing Sources: Electric Utility Generating Units," published in the June 18, 2014 *Federal Register* under the authority of the Clean Air Act §111(d).

<sup>5</sup> Minn. Rules part 7843.0500, Subd. 3.

<sup>6</sup> Docket No. ET2/RP-14-813, Member Initial Comments dated March 2, 2015.

continuing our efforts to meet Minnesota’s 1.5 percent annual Conservation Improvement Program goal.

Since we filed the IRP, we have been actively moving forward on our Preferred Plan. We are engaged in final negotiations to terminate our obligation to purchase 50 percent of the output of Genoa 3.<sup>7</sup> We have concluded several new capacity sales agreements with counterparties.<sup>8</sup> GRE and our Members remain active in solar energy development.

## **II. Department Comments and GRE Reply**

The Department recommends that the Commission accept GRE’s 2014 IRP.<sup>9</sup> The Department concluded that our overall planning approach is reasonable, but questioned one aspect of our modeling of demand-side management (“DSM”) scenarios.<sup>10</sup> We address this below under “Planning Approach.” The Department also recommends that the Commission approve GRE’s energy and demand forecast,<sup>11</sup> as further described below under “Energy and Demand Forecast.” With respect to modeling, the Department requested additional information from GRE concerning the capacity cost assumption for a potential new hydro purchase from Manitoba Hydro. Our response to that request is below under “Modeling Comments.” The Department recommends that the Commission approve annual energy savings goals of 137,546 MWh annually. We disagree with this recommendation as we discuss below

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<sup>7</sup> Docket No. ET2/RP-14-813, GRE Notice of Changed Circumstance dated February 19, 2015.

<sup>8</sup> Docket No. ET2/RP-14-813, GRE Notice of Changed Circumstance dated March 5, 2015 and April 1, 2015.

<sup>9</sup> Docket No. ET2/RP-14-813, Department Comments dated March 2, 2015 (the “Department Comments”), in Cover Letter.

<sup>10</sup> Department Comments at 5.

<sup>11</sup> Department Comments at 33.

under “Demand Side Resources.” We agree with the Department’s recommendations for future resource plans:<sup>12</sup>

- continue to use an appropriate capacity expansion model,
- continue to apply the Commission-approved externality costs and CO<sub>2</sub> regulatory costs in the reference case,
- continue to evaluate cost-effective retirement of coal plants,
- evaluate cases in which market sales are prohibited (or priced at zero), and
- use our capacity expansion model to evaluate different levels of DSM in isolation from additional renewables scenario.

GRE appreciates the Department’s thorough review of our 2014 IRP, including our planning method, energy and peak demand forecasting, demand side resources, modeling, compliance with the Renewable Energy Standard, and compliance with environmental requirements.

#### **A. Planning Method**

The Department concluded that GRE’s “overall planning approach is reasonable.”<sup>13</sup> The Department noted, however, that GRE “did not use its capacity expansion model to conduct scenario analysis of its four different demand side management levels to evaluate the impact of each scenario on its system costs.”<sup>14</sup> GRE did model cases with higher levels of demand side conservation in the capacity expansion model; however, they were combined with other sensitivity changes. We also evaluated the impacts of 1.75 percent and 2.00 percent energy efficiency on the forecast.<sup>15</sup> We also conducted an evaluation of higher levels of demand side

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<sup>12</sup>Department Comments at 5, 33.

<sup>13</sup> Department Comments at 5.

<sup>14</sup> Department Comments at 5.

<sup>15</sup> GRE IRP at 101, 102.

conservation savings of 1.25 percent, 1.50 percent and 2.00 percent while maintaining supply side savings in each scenario at 0.50 percent. This Conservation Plan Scenario Analysis (“LADCO Study”) was included in the IRP as Appendix D. This analysis studied the cost effectiveness and rate impact of four levels of demand side conservation and energy efficiency plans. As noted above, in future IRPs, we will use our capacity expansion model to evaluate different levels of demand side conservation in isolation from other sensitivities.

## **B. Energy and Demand Forecast**

The Department evaluated our forecasting models and results for reasonableness, specifically the forecast methodology, the residential consumer forecasts, and the study of peak demand diversity with the load of the Midcontinent Independent System Operator’s (“MISO”) coincident peak.<sup>16</sup> The Department recognized the changes GRE made in our 2014 IRP forecast process compared to our 2012 IRP forecast. The changes we made were in direct response to comments received in our 2012 IRP proceedings, and include the following:

- third party development of our residential consumer forecast,
- additional level and clarity of documentation provided for the energy and demand forecast,
- additional explanation around any additions or subtractions to the energy and demand forecast, and
- reduced or eliminated ex-post facto adjustments to the forecast.

The Department replicated GRE’s 2014 IRP energy and demand forecast, and also developed its own independent energy and demand forecast using GRE’s data to compare to our energy and demand forecasts. The Department evaluated alternative model specifications, aggregated the regional All Requirements Member forecasts, and evaluated growth rates. The

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<sup>16</sup> Department Comments at 6.

Department concluded that its models and GRE's models come to essentially the same conclusions.<sup>17</sup>

The Department found GRE's residential forecast to be reasonable,<sup>18</sup> and that the Department's energy and demand forecasts provided similar results to GRE's forecasts.<sup>19</sup>

### **C. Demand-Side Resources**

We would like to offer a correction to the Department's description of GRE's Preferred Plan on page 4 of its comments. The first bullet in Section E, GRE's Proposed Plan should read as follows:

“Continue conservation and energy efficiency programs; strive to meet 1.5 percent per year Minnesota goal (~~0.93~~ 1.0 percent member side demand side conservation is built into preferred plan).”

As described on page 58 of our IRP, we have estimated total achievements over the forecast period to be 1.5 percent of total retail energy savings in each year. One percent savings is expected to come from member side conservation and energy efficiency activities and 0.5 percent is expected to come from investments in supply side efficiency in our and our Members' systems.<sup>20</sup> Our Preferred Plan continues our commitment to work toward achieving 1.5 percent conservation and energy efficiency per year. The confusion over the “0.93 percent” may have come from the planning and cost data that were used in the LADCO Study evaluation of energy efficiency costs at varying levels of utility achievement in Appendix D of the IRP.<sup>21</sup> The 0.93 percent was used as the baseline in the LADCO Study, but was not used in our Preferred Plan.

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<sup>17</sup> Department Comments at 12.

<sup>18</sup> Department Comments at 6.

<sup>19</sup> Department Comments at 12.

<sup>20</sup> GRE IRP at 58.

<sup>21</sup> GRE IRP, at Appendix D – 60.

The Department recommended that the Commission approve annual demand side energy savings of 137,546 MWh, or 1.25 percent energy savings for GRE,<sup>22</sup> rather than the current 1.0 percent demand side Conservation Improvement Program (CIP) goal as specified in Minn. Stat. §216B.241, Subd. 1c. GRE has not historically achieved 137,546 MWh of energy savings as recommended by the Department. As summarized in Table 5 of the Department's comments, GRE's average annual historical savings from 2008 through 2013 was 106,549 MWh. Our highest level of savings was 134,428 MWh in 2010, which is also the year we incurred our highest level of expenditures of \$26.3 million.<sup>23</sup>

The Department provided three reasons for its proposed higher savings goals:

- average cost;
- reduce GRE's dependence on infrastructure savings; and
- increase progress toward the State's greenhouse gas reduction goals and complying with EPA's 111(d) proposed rule.<sup>24</sup>

In recommending energy savings equal to 1.25 percent of retail sales, the Department suggested that conservation with lifetime costs lower than average system energy costs should be implemented. GRE disagrees with using a utility's average system cost as a threshold cost for energy efficiency programs. A number of variables can reduce the total impacts of efficiency projects to the utility, including weather effects, changes in behavior, and early product failure. Such an approach introduces additional costs and does not adequately consider the risks associated with long technology lifetimes.

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<sup>22</sup> Department Comments at 16.

<sup>23</sup> Department Comments at 14.

<sup>24</sup> Department Comments at 17.

The Department did not consider the impact of additional conservation on Member rates. GRE and our Members believe that rate impacts are a very important consideration. Higher levels of conservation will require higher implementation costs, as discussed in the LADCO Study in the IRP. The LADCO benefit/cost analysis concluded that the Ratepayer Impact Measure test is not cost effective in any scenario, meaning that costs outweigh benefits with any level of increased conservation.<sup>25</sup> Another reason that additional conservation does not economically benefit our Members is because increased energy savings will not impact resource choices during the planning period, as noted by the Department.<sup>26</sup>

The Department's second reason for a higher level of energy savings is that it would reduce pressure on GRE's need to identify electric utility infrastructure savings to meet its goals. We believe, however, that supply side savings opportunities will continue to exist. We continue to seek supply side efficiency savings, and expect we will continue to achieve savings in the forecast period. In response to MCEA Information Request No. 34, GRE offered potential areas for additional infrastructure savings that we are considering. These areas are:

- compressed air system upgrades;
- dust collection ductwork upgrade;
- clean-up air classifier;
- air heater efficiency enhancements;
- variable frequency drives;
- boiler superheat temperature improvements;
- plant lighting upgrades, including LED lighting;

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<sup>25</sup> GRE IRP at Appendix D-10.

<sup>26</sup> Department Comments at 16.

- scalping wheel upgrade;
- Grapple crane power pack pump upgrade;
- Mill Motor IRIS PD continuous monitoring;
- Mill Motor quick disconnect; and
- turbine sensitized packing.<sup>27</sup>

The Department's third argument for a higher level of conservation savings by GRE and our Members is that it will increase our ability to make progress toward greenhouse gas emissions reductions goals. The NextGen's first milestone goal is a 15 percent reduction in CO<sub>2</sub> emissions in 2015. We have already achieved a 19 percent reduction in CO<sub>2</sub> emissions since 2005, as shown in Table 4-1 of the IRP.<sup>28</sup> The U.S. Environmental Protection Agency's proposed 111(d) rule is yet to be finalized. Under the proposed rule, conservation and energy efficiency is one of several optional building blocks that can be used to achieve emissions reductions. It is not known how conservation and energy efficiency will be handled in the final rule. The proposed rule envisions that utilities can use any, some, or all of the building blocks to achieve emission reductions. No single building block is required. Consequently, we believe it is premature to require increased demand side conservation and energy efficiency savings in our 2014 IRP to meet the final 111(d) rule.

GRE and our Members will work to evaluate new demand side and supply side technologies, and to provide incentives for those technologies that offer benefits to GRE's system and all Members. GRE's current energy efficiency program portfolio is appropriate for our Members, meets all legislative requirements, and balances the rate impacts associated with

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<sup>27</sup> Docket No. ET2/RP-14-813, GRE Response to Environmental Intervenors dated March 2, 2015.

<sup>28</sup> GRE IRP at 40.

these programs. We will continue to work to achieve Minnesota’s conservation goals. For the reasons discussed above, we do not agree with the Department’s recommendation to increase demand side annual conservation and energy efficiency from the statutory requirement of 1.0 percent to 1.25 percent.

#### **D. Modeling Comments**

The Department analyzed GRE’s modeling efforts by reviewing model inputs, scenarios modeled, and model outputs. This included evaluating scenarios, externalities, cost of existing and new resources, market interaction, reserve margin, coal retirements, and other assumptions. The Department found that GRE met the requirements for externality values, and used the Commission approved CO<sub>2</sub> regulatory costs. The Department noted that GRE’s reference case and preferred cases are consistent with Commission requirements.<sup>29</sup> The Department reviewed existing and new resource costs inputs and sensitivities and concluded they are generally reasonable, although they noted a possible concern with the cost estimates used for potential hydro resources.<sup>30</sup> The Department concluded that GRE’s treatment of market access is reasonable.<sup>31</sup> The Department noted that GRE allowed its coal units to be retired in the modeling.<sup>32</sup> The Department noted that GRE has a surplus capacity position through the planning period.<sup>33</sup> In the comments, the Department asked us to provide a discussion justifying the capacity cost assumption for the potential new hydro resource in our Preferred Plan.<sup>34</sup> We are in early discussions with Manitoba Hydro on a new power supply

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<sup>29</sup> Department Comments at 18.

<sup>30</sup> Department Comments at 18.

<sup>31</sup> Department Comments at 19.

<sup>32</sup> Department Comments at 20.

<sup>33</sup> Department Comments at 21.

<sup>34</sup> Department Comments at 23.

product, and have not yet identified the type of hydro product we may end up purchasing. Consequently, we have not yet identified the costs of the new hydro power supply product. The product could be energy only, a diversity exchange agreement, a combined capacity and energy product, or any combination of these. Any future modeling evaluating new hydro resources will reflect the costs as they are known.

The Department expressed a concern that if the new hydro power supply product is not added to GRE's system, the required additional energy will likely come from one of GRE's coal plants.<sup>35</sup> We do not reach the same conclusion, as our belief is that without a new hydro product, the energy needed to serve our Members would most likely come from other renewable resources, natural gas-fired plants, or market sources.

In its discussion of coal plant retirements, the Department concluded it would be premature to make a decision on retiring Stanton Station in this proceeding.<sup>36</sup> Their conclusion is based on their assessment of our modeling, the application of externalities, and sensitivities around load growth. The Department concludes that if "for example, GRE's forecast turns out to be too low, GRE's modeling indicates that keeping Stanton Station online would be more cost effective than retirement and replacing it with a natural gas plant."<sup>37</sup> We support this conclusion. In response to MCEA Information Request No. 23,<sup>38</sup> we noted that our baseload resources, including Stanton Station, produce a consistent amount of energy at known prices that are used to offset load costs from the MISO energy market. Taking any baseload resource out of our portfolio removes that hedge and exposes our Members to uncertain market prices.

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<sup>35</sup> Department Comments at 25.

<sup>36</sup> Department Comments at 24.

<sup>37</sup> Department Comments at 24.

<sup>38</sup> Docket No. ET2/RP-14-813, GRE Response to Environmental Intervenors dated February 23, 2015.

Our baseload resources have been and remain important to serving our Members' needs in a reliable and cost-effective manner.

**E. Compliance with the RES**

The Department found that GRE is well situated to meet our RES obligation through at least 2025.<sup>39</sup>

**F. Comments on Environmental Issues**

The Department reviewed GRE's compliance with the Acid Rain Program, Cross State Air Pollution Rule, Regional Haze, Mercury and Air Toxics Standards, and our monitoring of the 111(d) rule and other environmental regulations. After this review, the Department concluded that "GRE is adequately tracking state and federal environmental regulations and compliance."<sup>40</sup>

The Department concluded that GRE used the most recent methodology for estimating CO<sub>2</sub> emissions associated with retail sales in Minnesota as set forth in Southern Minnesota Municipal Power Agency's (SMMPA) 2014 IRP.<sup>41</sup> However, GRE disagrees with the characterization that GRE is not on a path to meet the state's greenhouse gas reduction goal. Our 2013 greenhouse gas emissions were 19 percent below 2005 levels. As discussed below in our response to the Environmental Intervenors, there is also an uncertainty in the modeling methodology for forecasting future CO<sub>2</sub> emissions. GRE is committed to working with the Department, Commission staff and other stakeholders in developing a calculation methodology to appropriately determine CO<sub>2</sub> emissions. GRE participated in the meeting held by the

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<sup>39</sup> Department Comments at 29.

<sup>40</sup> Department Comments at 31.

<sup>41</sup> Department Comments at 31.

Department on February 26, 2015 to discuss the methodology for calculating the CO<sub>2</sub> intensity of regional generation sources. We anticipate that additional learning through GRE's and other utilities' modeling efforts will help to inform the process of forecasting future CO<sub>2</sub> emissions.

In addition, after 2015, the next NextGen goal occurs in 2025. Assuming a two-year IRP filing requirement, GRE could submit up to five more IRPs before 2025. Each IRP will include additional analyses of our actual CO<sub>2</sub> emissions and projected emission reductions with respect to the NextGen, and the 111(d) rule. Given the current dynamic nature of the state's procedures for demonstrating compliance with the NextGen, and the uncertainty associated with the requirements to demonstrate compliance with the 111(d) rule, we believe it is not appropriate at this time to conclude that we will not meet the 2025 CO<sub>2</sub> emissions reduction goal. As discussed elsewhere in these Reply Comments, resource planning is an iterative rather than a static exercise. As compliance requirements and methodologies develop, we will refine our modeling methodology and continue to work to meet these goals as we have strived to meet all other state energy policy goals.

### **III. Reply to the Environmental Intervenors**

The Environmental Intervenors claim that GRE's IRP has "a number of critical flaws" and go on to ask the Commission to "order GRE to submit a revised IRP that adequately plans for a clean energy future."<sup>42</sup> As we discuss below, we disagree with each of the so-called "flaws." We also disagree with the suggestion that GRE should be required to file a revised IRP. GRE's IRP demonstrates a comprehensive resource planning evaluation which complies with all the

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<sup>42</sup> Docket No. ET2/RP-14-813, Environmental Intervenor Initial Comments, dated March 2, 2015 (the "Environmental Intervenor Comments") at 2.

evaluation criteria set forth in Minn. Rules 7843.0500, subp 3.<sup>43</sup> GRE's IRP also complies with the Commission's orders in previous IRP proceedings. The Department has reviewed the IRP and recommends that the Commission accept the IRP. To suggest that GRE should be required to file a revised IRP disregards the comprehensive evaluation that we have provided, and disregards the efforts of the Department and others in reviewing and analyzing the IRP.

**A. CO<sub>2</sub> Emissions Reductions Modeling**

The Environmental Intervenors offered comments on the CO<sub>2</sub> emissions reductions analysis in our IRP in the areas of compliance with Minnesota's greenhouse gas reduction goals and with EPA's 111(d) rule.

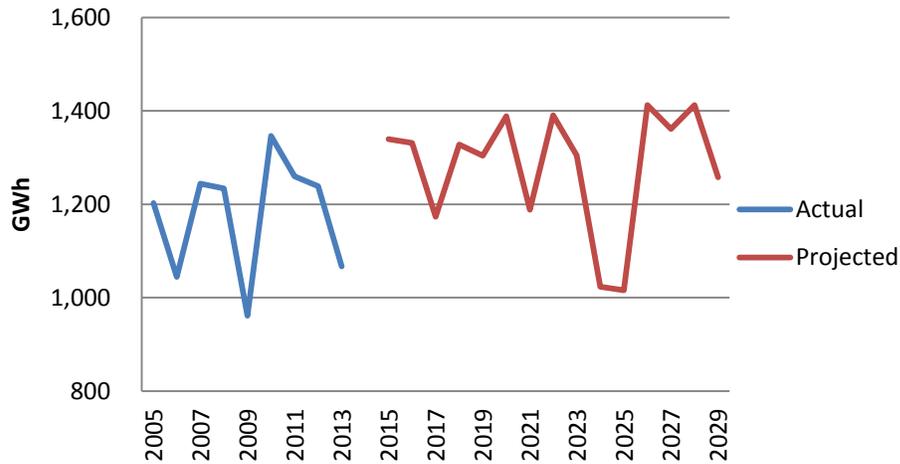
**i. Minnesota Next Generation Energy Act**

The Environmental Intervenors dispute the adjustments we made to the modeling results related to the production from Stanton Station and the quantity of market sales. GRE's modeling methodology and assumptions are described in detail in the IRP in Sections 7 and 9. As is common in the modeling process, we review the modeling results for results that do not seem reasonable based on our experience with our resources, the market and other factors. When we reviewed the modeling results, we identified two unusual factors that affect the projections of CO<sub>2</sub> emissions: (a) unexpectedly high generation from Stanton Station, and (b) significantly low market sales. For Stanton Station, the model predicted higher production output than we have experienced at Stanton over the past nine years. Figure 1 shows historic actual annual production for Stanton Station, and the original modeled annual production.

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<sup>43</sup> See GRE IRP, Section 2.3 for summary.

## Stanton Generation



**Figure 1: Comparison of Stanton Station actual and original modeled production.**

We also recognized that the model forecasted market sales to be less than actual historic sales levels. These forecasted sales results were due to a constraint we incorporated in the model. In the model, we limited market interaction to 400 MWs per hour so that the model would not select a new generation resource to serve market needs instead of member requirements. Higher levels of market interaction would not be consistent with our historic interaction. Figure 2 compares actual market sales history to projected market sales in the original modeling results.



**Figure 2: Comparison of Market Sales actual and original model output.**

The Environmental Intervenors imply that we unreasonably manipulated the model. In fact, the adjustments we made were to calibrate CO<sub>2</sub> emissions to Stanton production and market sales similar to what they have been in the past. These adjustments were only made in calculating CO<sub>2</sub> emissions after the modeling work was done.

We do not understand the Environmental Intervenors’ comments related to subtracting CO<sub>2</sub> emissions associated with “off-system sales.”<sup>44</sup> Environmental Intervenors seem to claim that market sales were erroneously counted toward reducing CO<sub>2</sub> emissions under the NextGen. This claim is, however, inconsistent with the Department’s recommendations for assessing conformance with NextGen goals. The Department’s Comments indicate that GRE’s calculations were completed in accordance with the methodology set forth in the SMMPA IRP.<sup>45</sup>

<sup>44</sup> Environmental Intervenor Comments at 3.

<sup>45</sup> Department Comments at 31; Docket No. ET2/RP-13-1104

GRE believes our efforts to assess conformance with the NextGen are reasonable and within the current interpretations of the NextGen. Relying on IRP expansion planning model projections to assess future compliance with the NextGen is a new exercise for us and for other utilities. The issue of how to calculate compliance with the NextGen has only come before the Commission twice (SMMPA IRP and OTP IRP<sup>46</sup>), and only very recently. Clearly there is work to be done in understanding how CO<sub>2</sub> emissions are best projected. GRE is committed to working with the Department and the Commission to find the best methodology. GRE participated in the Department's meeting on February 26, 2015 to discuss the methodology for calculating the CO<sub>2</sub> intensity of regional generation sources. We anticipate that additional learning through GRE's and other utilities' modeling efforts will help to inform the process of forecasting future CO<sub>2</sub> emissions with better accuracy and definition.

**ii. EPA Rule 111(d)**

A new and confounding issue in forecasting future CO<sub>2</sub> emissions is how to calculate CO<sub>2</sub> emissions under the U.S. EPA's Rule 111(d). In the most recent Otter Tail Power IRP docket, Commission staff discuss the complexities of both the timing of compliance and how to demonstrate compliance. For instance, Commission staff acknowledges that: (a) the final rule will not be issued until June 2015; (b) the rule could be subjected to litigation; and (c) the rule would apply to Otter Tail Power's entire fleet in three separate states.<sup>47</sup>

Similar issues apply to GRE, including the potential uncertainties introduced by owning generating plants in North Dakota. Rule 111(d) proposes state specific limits on the CO<sub>2</sub>

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<sup>46</sup> Docket No. ET2/RP-13-961

<sup>47</sup> Docket No. ET2/RP-13-961, Staff Briefing Papers dated October 23, 2014, at 3.

intensity of energy from affected generating units within a state's borders. As proposed, there is significant variance in the limits from state to state. Minnesota's limit is 873 lbs CO<sub>2</sub> per MWh, a 40.6 percent reduction from 2012, and North Dakota's goal is 1,783 lbs CO<sub>2</sub> per MWh, a 10.6 percent reduction from 2012. In addition, the rule gives states latitude in determining how they will meet their specific carbon dioxide intensity limits. The complexity of owning generating units in one state and serving load in another, the disparity in the proposed state limits, and the likely differing approaches of Minnesota and North Dakota present significant challenges to any modeling analysis of the impact of the rule.

Regardless of these uncertainties, GRE proactively evaluated one way to look at how Rule 111(d) might impact our system. Each resource plan before the Commission, including GRE's, will contribute to the broader goal of developing a reasonable, reliable and least-cost 111(d) compliance plan for the State of Minnesota. The Commission, utilities, the Department, the Minnesota Pollution Control Agency (MPCA) and interested parties are discussing compliance issues in advance of MPCA submitting a state implementation plan.

#### **B. Energy Efficiency Costs**

As described in the IRP, GRE will continue to work toward achieving the Minnesota's conservation improvement program goal of 1.5 percent demand side and supply side conservation and energy efficiency annual savings. This is included in our Preferred Plan. The Environmental Intervenors make a number of inaccurate and misleading statements regarding the evaluation of energy efficiency programs presented in our IRP. The statements can be grouped into three areas:

- the cost estimates and methodology used in the Conservation Plan Scenario Analysis, or the LADCO Study, are outdated and unreasonable and not supported by the experience of investor-owned utilities in Minnesota and other utilities across the country;
- a level of 2.0 percent demand side conservation is cost-effective and results in minimal rate increases; and
- there was insufficient information on where 0.5 percent supply side savings could be obtained.

To evaluate the potential costs and benefits of differing conservation and energy efficiency levels, GRE conducted an evaluation of meeting varying levels of energy savings considering benefits/costs and rate impacts. The analysis was conducted by LADCO Services, and is included as Appendix D of the IRP. The study considered demand side conservation levels of 0.93 percent base case, 1.25 percent, 1.50 percent and 2.00 percent. The study evaluated benefits and costs under the Societal, Utility, Ratepayer, and Participant Test Perspectives.

**i. Cost Estimates and Methodology**

The Environmental Intervenors state that the factors used in the LADCO Study to escalate program costs are outdated because the Commission rescinded the use of the factors in 2012.<sup>48</sup> The Commission rescinded the use of the factors for calculation of utility incentives based upon the results of one program year (2010), the first year in which the 1.5 percent savings requirement became effective. In this IRP, the scenario plans were assumed to be implemented over an extended period of 15 years. There is a significant difference between

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<sup>48</sup> Environmental Intervenor Comments at 5.

considering a single year of implementation and an extended IRP period of 15 years at a substantially greater level of savings. A much greater effort must be made to maintain a program with aggressive savings over an extended time period.

The Environmental Intervenors state the program and administrative costs used in the LADCO Study are too high and the cost increases are “extraordinary” when compared to other utilities.<sup>49</sup> To support this view, the Environmental Intervenors reference a 2008 Synapse Energy Economics, Inc. presentation detailing the experiences of several utilities between 1990 and 2007. No effort was made by the Environmental Intervenors to review more current costs of utility conservation programs. Conservation and energy efficiency technologies have changed significantly since 1990, and the costs to achieve the same amount of savings have increased. The data used by the Environmental Intervenors is quite dated. GRE reviewed 2013 EIA-861 data for the existing utilities that were used in the Synapse data referenced by the Environmental Intervenors. We reviewed Minnesota regulatory filings for Interstate Power and Light and Minnesota Power conservation program data. We then compared these utilities’ program costs to the program costs in the LADCO Study. Figure 3 below shows these comparative program cost data.

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<sup>49</sup> Environmental Intervenor Comments at 5, 6.

Comparison of 2013 Program Percent of Sales and Costs per kWh<sup>50</sup>

	2013		2013
EIA Data	% of Sales	First Year Cost/kWh	% Residential Sales
Interstate P&L MN	1.0	\$0.266	35
San Diego G&E	1.3	\$0.308	46
Sacramento MUD	1.7	\$0.205	45
Southern Cal. Edison	1.1	\$0.395	40
Pacific Gas & Electric	1.9	\$0.286	40
Seattle City Light	1.5	\$0.283	33
<b>MN Filings</b>			
Interstate P&L MN	1.0	\$0.266	35
Minnesota Power	2.5	\$0.083	26
<b>Average</b>	<b>1.6</b>	<b>\$0.261</b>	
GRE LADCO Scenarios			
0.93%	0.9	\$0.128	60
1.25%	1.3	\$0.204	60
<b>1.5%</b>	<b>1.5</b>	<b>\$0.260</b>	60
2.0%	2.0	\$0.336	60

**Figure 3: Comparison of Synapse Data with EIA data, GRE Scenarios, and Residential Sales.**

The average energy efficiency program cost for these utilities was \$0.261 per kWh. The LADCO Study projected GRE program costs per kWh in the 0.93 percent and 1.25 percent scenarios lower than the average cost of the utilities' average cost. The GRE 1.5 percent scenario program costs are very similar to the average costs of the utilities, with a similar

<sup>50</sup> Source: EIA Data taken from Utility EIA Form 861 submissions:  
<http://www.eia.gov/electricity/data/eia861/index.html>; IPL E,G-001/CIP-12-484.01 Tab 3 Electric; E015/CIP-10-526.03 Exhibit 5 page 1 of 1.

percent of sales. This comparison demonstrates that GRE's program costs, as evaluated in the LADCO Study, are reasonable and comparable to other utilities.

GRE notes that we have a substantially higher percent of residential and rural consumers than all utilities in the above comparison. It is not reasonable to compare GRE's savings levels to other utilities which do not have a similarly high percentage of residential customers.

a. Cost-Effectiveness of Higher Conservation Levels.

Environmental Intervenors claim that a 2.0 percent demand side conservation scenario is cost-effective. The Environmental Intervenors state that Minnesota "preferentially uses the Societal Test to screen energy efficiency programs ..." <sup>51</sup> Minn. Stat. 216B.241 subd.1c.(f) clearly states: "For the purpose of this paragraph, in determining cost-effectiveness, the commissioner *shall consider the costs and benefits to ratepayers, the utility, participants, and society.*" GRE and our Members believe it is appropriate to consider ratepayer impacts in evaluating conservation program costs. The LADCO analysis showed the benefit cost ratios for all levels of conservation to be under 1.0 percent in the Ratepayer Test Perspective, meaning the costs outweigh the benefits for ratepayers. The analysis also showed decreasing benefit cost ratios under the Societal, Utility, and Ratepayer Test Perspectives as conservation levels increase, with the lowest values occurring in the 2.0 percent scenario. <sup>52</sup>

The Environmental Intervenors portray the rate increase of \$0.0092 and \$0.0086 per kWh associated with the LADCO Study's 2.0 percent scenario as "quite small." <sup>53</sup>

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<sup>51</sup> Environmental Intervenor Comments at 7.

<sup>52</sup> GRE IRP Appendix D, Table 5.3 at D-10.

<sup>53</sup> Environmental Intervenor Comments at 9.

The Environmental Intervenors misrepresent GRE's wholesale rate. Our 2013 wholesale rate was \$0.0704 per kWh, not \$0.704 per kWh, a decimal place off. The associated increased conservation program costs of \$0.0092 and \$0.0086 per kWh would equal wholesale rate increases of 13 percent and 12 percent respectfully, *not* 1.3 percent and 1.2 percent as the Environmental Intervenors claim. Both the percentage rate impact and the absolute dollars of the higher conservation spending are startling. As Figure 5.1 of the LADCO Study shows, the increase from the 0.93 percent Base Case conservation achievement cost to the 2.0 percent scenario results in five times the spending to reach a doubling of results. In other words, conservation program spending to achieve a 2.0 percent level will cost our members over \$62 million every year above what they currently spend.

b. Supply Side Savings.

The Environmental Intervenors state GRE did not provide information on where supply side energy efficiency efforts might come from.<sup>54</sup> This is not true. GRE provided a number of potential supply side efficiency areas that we are evaluating in response to MCEA Information Request No. 34, and as discussed above.

**C. Solar Costs**

The Environmental Intervenors state that GRE overestimated the costs associated with utility-scale solar.<sup>55</sup> In quibbling over estimates of future solar costs in the models, they overlook the fact that GRE and our Members continue to invest in solar generating facilities, as evidenced by the 19 new Member solar facilities which are complete or in development in our Member's service territories.

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<sup>54</sup> Environmental Intervenor Comments at 9.

<sup>55</sup> Environmental Intervenor Comments at 11.

At the time our modeling was conducted, we used utility-scale solar costs from a standard industry source – the U.S. Energy Information Administration’s (EIA) April 2013 “Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants.”<sup>56</sup> At that time, the EIA’s 2012 overnight construction cost for solar photovoltaics generation resources was \$4,183 per kW. To address potentially lower costs, we also modeled a sensitivity with a 30 percent cost reduction for utility-scale photovoltaics resources of \$2,928 per kW. The Environmental Intervenors state that GRE failed to apply a regional cost adjustment of 95 percent.<sup>57</sup> The 30 percent cost reduction sensitivity easily incorporates a 95 percent regional cost adjustment.

The Environmental Intervenors also take issue with GRE’s solar photovoltaics system transmission costs.<sup>58</sup> GRE’s estimate of transmission costs is based on our experience with the cost of transmission infrastructure for wind resources. Wind resources are typically developed in less densely populated areas. The Environmental Intervenors claim, without support, that solar photovoltaics systems can be sited in more suburban and urban areas, with “relative ease.” Presumably “relative ease” means without having to build additional transmission infrastructure. Based on our experience as a transmission owner, we question that assumption. Utility-scale solar photovoltaic system development in Minnesota is in its infancy. Given potential project siting concerns, GRE believes it is prudent to expect and plan for transmission costs associated with utility-scale solar photovoltaic systems.

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<sup>56</sup> GRE used this source for all new generating resources in the model, with the exception of wind.

<sup>57</sup> Environmental Intervenor Comments at 10-11.

<sup>58</sup> Environmental Intervenor Comments at 12.

As we gain experience with the installation and operation of new solar facilities, we will refine our cost estimates for installation and transmission interconnections in future IRPs.

**D. Excess Capacity**

The Environmental Intervenors briefly complain about two of GRE's coal-fired generating resources. In connection with Stanton Station, they claim that GRE does not want to retire Stanton Station due to its contribution to "off-system sales revenue." As we discuss in the IRP and elsewhere in these Reply Comments, our modeling does not support retiring Stanton Station. While we are not sure we understand the reference to "off-system sales revenue," we offer Stanton Station energy into the market, as we do with the energy from all of our generating resources. When our on-line/operating generation is higher than our load in any given hour, net market sales of energy occur. When our load is higher than our on-line/operation generation, net market purchases of energy occur. On average, GRE is not a significant net energy buyer or seller in the market. In other words, averaging out our net market purchases and sales, our on-line/operating generating resources provide about the needed amount of energy for our Members. As we discuss in the IRP, we have length in capacity. Our limited term capacity sales are MISO Zonal Resource Credits. Such sales are not specific to a particular generating unit. We have entered into these transactions to offset costs for our member in the longer term planning horizons when our capacity is not needed to meet our Member's demand needs. Our market participation strategies are neither risky nor speculative.

#### **E. GRE Promotion of Electric Vehicles Not Tied to State Energy Goals**

GRE agrees with the Environmental Intervenors' comment that "electric vehicles can play an important role in our transportation infrastructure and policy."<sup>59</sup> We find no support in the Environmental Intervenor comments for the statement that GRE's promotion of electric vehicles "is not sufficiently tied to state energy goals."<sup>60</sup>

GRE's Plug-in Electric Vehicles ("PEVs") pilot program is primarily focused on the charging of PEVs. It is our intention to ultimately have a PEV charging program that encourages the charging of PEVs during the off peak hours. In addition to absorbing wind energy, charging PEVs during the off peak hours: (a) does not require additional infrastructure such as new generation resources or transmission lines; (b) improves the overall system load factor by selling energy in times of low demand periods; (c) mitigates wholesale rate increases by selling additional kilowatt-hours during off peak periods; and (d) provides the end-use consumer with far lower transportation costs compared to gasoline.

#### **F. Preferred Plan Consistent with a Clean Energy Future**

The Preferred Plan, Expansion Plan E, includes additional wind and hydro energy, continues our energy efficiency and conservation programs and terminates our commitment to purchase capacity and energy from the Genoa 3 coal fired generating facility. Under the Preferred Plan, GRE is well positioned to respond to industry changes, including future requirements related to greenhouse gas emissions.

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<sup>59</sup> Environmental Intervenor Comments at 13.

<sup>60</sup> Environmental Intervenor Comments at 13.

The Environmental Intervenors ask the Commission to deny GRE's IRP if our Preferred Plan, Expansion Plan E, is preferred.<sup>61</sup> Instead, the Environmental Intervenors claim that Expansion Plan H is less risky than Plan E "in a world where carbon is regulated."<sup>62</sup> The only difference between Expansion Plan E and Expansion Plan H is that Expansion Plan H includes the retirement of Stanton Station. We disagree with the Environmental Intervenors claim, and note that the Department's analysis concludes that it is premature to decide to retire Stanton Station.<sup>63</sup> The 111(d) rule is not in place. We do not know how its implementation will affect our resources, market prices or the dispatch of our generating units.

Stanton Station has been and remains an important part of our generation portfolio, and serves as a hedge against price volatility in the MISO market. In response to MCEA Information Request No. 23, we noted that our baseload resources, including Stanton Station, produce a consistent amount of energy at known prices that are used to offset load costs from the market. Taking any baseload resources out of our portfolio would remove that hedge and leave our members with a large exposure to uncertain MISO energy market prices. Our baseload resources have been and remain important to serve our Members' needs in a reliable, cost-effective manner.

#### **IV. Reply to Al-Corn**

Al-Corn criticizes the timing of three of GRE's generating resources, Cambridge 2, Elk River Peaking and Spiritwood Station, and claims that GRE failed to justify the need for these

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<sup>61</sup> Environmental Intervenor Comments at 14.

<sup>62</sup> Environmental Intervenor Comments at 19.

<sup>63</sup> Department Comments at 24.

resources.<sup>64</sup> In fact, GRE received all appropriate internal and external approvals for these resources. Consistent with our governance processes, our Members approved all three of the resources and prior to the Great Recession. In addition, the two generating resources located in Minnesota were required to obtain Certificates of Need from the Commission. The Commission granted Certificates of Need to GRE for both projects.<sup>65</sup> Spiritwood Station is located in North Dakota. It was announced in 2006 as a combined heat and power plant and construction commenced in 2007, one day after Cargill signed a long term contract to purchase steam from Spiritwood for use at Cargill's adjacent malt plant. GRE has also entered into a long term contract to supply steam to a second steam host, a biorefinery owned by Dakota Spirit AgEnergy, LLC. At the time Spiritwood Station was planned, GRE had a need for additional generating resources. The project was approved by GRE's Members to address that need. Al-Corn's hyperbolic claims about "doubling-down" or "Machiavellian" purposes are absurd. Developing the plant as a combined heat and power facility provides the Members with benefits in terms of steam revenues and environmental attributes.

Al-Corn also claims that GRE fails to "adequately discuss plans to decrease its generation or conduct legitimate sales to third parties."<sup>66</sup> This is not true. The future scenarios we modeled allowed coal plants to be considered for retirement and coal contracts to be considered for termination, if it was economic to do so. The results of our capacity expansion modeling are described in detail in Section 9 of the IRP. As the Department points out, GRE's modeling

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<sup>64</sup> Docket No. ET2/RP-14-813, Al Corn Clean Fuel and Heartland Corn Products' Initial Comments (the "Al-Corn Initial Comments") at 5.

<sup>65</sup> See Docket Nos. CN-05-347 and CN-07-678.

<sup>66</sup> Al-Corn Initial Comments at 7.

allowed its coal units to be retired in 31 of the 32 cases we analyzed.<sup>67</sup> Our Preferred Plan specifically includes the termination of our long term obligation to purchase capacity and energy from Genoa 3, and we updated the Commission on our negotiations with Dairyland Power Cooperative in a Notice of Changed Circumstance in this docket on February 19, 2015. Subsequently, on March 5, 2015 and April 1, 2015, we filed additional Notices of Changed Circumstance indicating that we entered into transactions involving the sale of MISO Zonal Resource Credits to Minnesota Power and Missouri River Energy Services, respectively. Al-Corn specifically claims that GRE failed to evaluate the retirement of Spiritwood Station. This is not true. As discussed above, GRE’s modeling allowed our coal units to retire in 31 of the 32 scenarios we analyzed. Table 9-4, *“Comparison of coal retirement/removal and coal contract termination frequency by Expansion Plan”* summarizes the modeling results for all of GRE’s coal-based resources, including Spiritwood Station. Table 9-4 reflects that none of the expansion plans selected Spiritwood Station for retirement.

Finally, Al-Corn claims that our solar photovoltaic projects at our Maple Grove Headquarters and the proposed Electric Vehicle Program are “wasteful spending.”<sup>68</sup> Our Members do not agree. As described above, GRE and its Members are collaboratively implementing 19 solar photovoltaic projects. Contrary to Al-Corn’s claims, the merits of our proposed Electric Vehicle Program are described above.

## **CONCLUSION**

As the Commission has observed, “the resource-planning process is largely collaborative and iterative. The process is collaborative because there are few hard facts dictating resource

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<sup>67</sup> Department Comments at 20.

<sup>68</sup> Al-Corn Initial Comments at 10.

choices or deployment timetables. The facts on which resource decisions depend – how quickly an area and its need for electricity will grow, how much electricity will cost over the lifetime of a generating facility or a purchased-power contract, how much conservation potential the service area holds and at what cost – all require the kind of careful judgment that sharpens with exposure to the views of engaged and knowledgeable stakeholders. The process is iterative because analyzing future energy needs and preparing to meet them is not a static process; strategies for meeting future needs are always evolving in response to changes in actual conditions in the service area. When demographics, economics, technologies, or environmental regulations change, so do a utility’s resource needs, and its strategies for meeting them.”<sup>69</sup> In other words, a utility needs to position itself for an uncertain future. Our Preferred Plan does just that - it is a long term plan with the optionality to best serve GRE and our Members in a changing energy industry. We are in the final negotiations to terminate our long term purchase obligation for 50 percent of the output of Genoa 3 - significantly reducing coal energy from our portfolio. We plan to build additional renewable energy in the late 2020’s to meet Minnesota’s Renewable Energy Standard. We are evaluating the option of bringing additional hydro energy into our system. We are continuing efforts in conservation and demand side management. We have evaluated our CO<sub>2</sub> emissions, and our projections for how those emissions will change over the forecast period. Our plan meets the state’s guidelines for review of resource plans. Our Preferred Plan is a plan for a changing energy future.

We appreciate our Members support for our IRP filing and the Preferred Plan. We appreciate the Department’s thorough and careful review of our planning approach, energy

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<sup>69</sup> Docket E-017/RP-13-961, Order at 3.

and demand forecasts, modeling, assumptions, scenarios, externalities, costs of existing and new resources, market interaction, reserve margin and coal retirements. We appreciate the Department's recommendation to the Commission to accept the plan and the forecasts. We have agreed to make the changes to our next IRP as the Department has recommended. As we describe in these Reply Comments, neither the Environmental Intervenors nor AI-Corn has provided a basis for rejecting our IRP.

Dated: May 1, 2015

Respectfully submitted,

**GREAT RIVER ENERGY**

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## CERTIFICATE OF SERVICE

DOCKET No. ET2/RP-14-813

NATURE OF DOCKET: In the Matter of Great River Energy's 2015-2029  
Integrated Resource Plan

I, Donna Boe, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing or by first class United States mail.

Dated this 1<sup>st</sup> day of May 2015.

/s/DONNA BOE

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