

**BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION
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In the Matter of Further Investigation into
Environmental and Socioeconomic Costs under
Minnesota Statute § 216B.2422, Subdivision 3

OAH Docket No. 80-2500-31888
MPUC Docket No. E-999/CI-14-643

**CLARIFICATIONS AND EXCEPTIONS OF THE MINNESOTA
DEPARTMENT OF COMMERCE, DIVISION OF ENERGY RESOURCES AND
THE MINNESOTA POLLUTION CONTROL AGENCY– CRITERIA POLLUTANTS**

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INTRODUCTION

The Minnesota Department of Commerce, Division of Energy Resources (Department or DOC) and the Minnesota Pollution Control Agency (MPCA) (jointly, the Agencies) appreciate the thorough and detailed work of the Administrative Law Judge (ALJ) regarding this complex matter, and respectfully submit to the Minnesota Public Utilities Commission (Commission) the following recommended clarifications and exceptions to the ALJ's Findings of Fact, Conclusions and Recommendations: Criteria Pollutants (ALJ Report).

EXCEPTIONS

I. THE AP2 MODEL

The Agencies provide the following to clarify or correct several of the ALJ Report's Conclusions of Fact regarding the AP2 model.

In Conclusion of Fact No. 15 (page 95), the ALJ Report concludes that the Agencies failed to demonstrate that modeling individual pollutants separately is an approach commonly used in this field. The Agencies disagree. The record demonstrates that modeling emitted pollutants together (thus allowing for intra-plume interactions) and modeling emitted pollutants separately are both appropriate and commonly used to model the impacts of emitted air pollutants. DOC Ex. 811 at 27-28 (Muller Surrebuttal). Particularly in reduced-form models (which the Agencies were directed to use), modeling individual pollutants separately is quite common, as Dr. Muller pointed out. DOC Ex. 811 at 27-28 (Muller Surrebuttal). This approach is commonly used by other researchers in this field, including CEO Witness, Dr. Marshall,¹ as

¹ CEO Ex. 119 at 23 (Marshall Surrebuttal) (Dr. Marshall explained that “[t]he reality is that InMAP is a simplified (reduced-form) model that does not account for interactions between marginally emitted pollutants.”)

well as by other prominent studies that estimate environmental cost values (Fann *et al.*, 2009²; Levy *et al.*, 2009³). DOC Ex. 811 at 27-28 (Muller Surrebuttal).

In Conclusion of Fact No. 17 (page 95), the ALJ Report concludes that the Agencies' proposal to update the criteria pollutant (CP) externalities "will not result in reliable updates for CP externalities." The Agencies have no objection to the conclusion but note that the Conclusion misses the point of the testimony. The Agencies' purpose in providing projections of how damage values may change in the future was neither to offer definitive values for future use nor to propose a method for future updates of the values. Rather, they provided this evidence to demonstrate in a general way how the values may change over time, strictly for illustrative purposes. DOC Ex. 808 at 45, 66 - 70. Understanding how stable the marginal damage estimates are provides the Commission a sense of whether (and how frequently) updates may be necessary.

Id. The Agencies recommend that the Conclusion be amended to indicate the Agencies' purpose:

The Administrative Law Judge concludes that, while not a reasonable approach to use to update the values, the Agencies' proposal to update projections of the CP externalities values for future years by using a formula that projects changes in populations and mortality rates but holds emissions constant provides a useful indicator of how values may change over time is not a reasonable approach. There is no reason to believe that emissions will remain constant. Given that emissions drive mortality rates in this context, and that mortality rates have the largest impact on damages, the Administrative Law Judge concludes that the Agencies' update proposal will not result in reliable updates for CP externalities.

In Conclusion of Fact No. 18 (page 95), the ALJ Report concludes that Dr. Muller's modeling of hypothetical plants was not reasonable. The Agencies recommend that the

² DOC Ex. 811 at 27-28 (Muller Surrebuttal) (*citing* Fann, N. C. Fulcher, B. Hubbell. The influence of location, source, and emission type in estimates of the human health benefits of reducing a ton of air pollution. *Air Quality Atmosphere and Health*. 2: 169-176).

³ DOC Ex. 811 at 27-28 (Muller Surrebuttal) (*citing* Levy JI, Baxter LK, Schwartz J. 2009. "Uncertainty and variability in health-related damages from coal-fired power plants in the United States." *Risk Analysis* 29(7) 1000-1014).

Commission not adopt Conclusion of Fact No. 18 because the ALJ Report appears to misunderstand that the Agencies' purpose for providing evidence regarding the value ranges for hypothetical plants was different from the purpose in modeling actual plants.

The Agencies modeled actual plants to provide damage value ranges for the emission of one additional ton of emissions from the largest emitters in the state, using the actual characteristics (e.g. stack height) of the facilities. DOC Ex. 811 at 21-22 (Muller Surrebuttal). In contrast, the values associated with hypothetical plants are based on having no specific information about a potential new plant (e.g., stack height,) except for the county location from which an additional ton of emissions would be emitted. The Agencies provided marginal damages for each pollutant for each county in Minnesota, whether or not it currently has an active plant, for the purposes of electric resource planning should a power plant be sited there in the future. DOC Ex. 808 at 18-19 (Muller Direct). Modeling of hypothetical plants can provide the Commission the ability to compare damage estimates of yet-to-be defined future resources, based solely on location. This does not hamper or preclude the Commission's ability to consider externality values in proceedings in which the location of a new resource is not known. Rather, use of real and hypothetical plants to estimate county-by-county externality values affords the Commission the ability to consider location in proceedings in which location is relevant.

This approach, of modeling hypothetical plants, was also adopted by Xcel Witness Dr. Desvousges. He modeled emissions from three hypothetical plants, purportedly to represent urban, metropolitan fringe and rural locations. Dr. Muller's approach to modeling hypothetical

plants had the same purpose as that of Dr. Desvousges, except that Dr. Muller's approach was done at the more granular and less ambiguously-defined⁴ spatial scale (county-by-county).

The record shows that the values for hypothetical source locations are generally higher because these sources were modeled with the characteristic of lower effective stack heights than those of the six individually-modeled plants. DOC Ex. 811 at 22 (Muller Surrebuttal). The assumption of a lower stack height for hypothetical plants was reasonable because that characteristic, of lower effective stack height, "...corresponds to most facilities other than the six individually modelled plants..." *Id.* A lower effective stack height implies that, all else equal, the change in air quality will be larger than for the individually-modeled plants. *Id.* The Agencies recommend that the Commission not adopt Conclusion of Fact No. 18.

Regarding Conclusion of Fact No. 19 (page 95) of the ALJ Report, the Agencies clarify that the various aggregations and summaries that Dr. Muller provided for environmental cost values included both the actual and the hypothetical plants. For example, the values in Table 6 on page 49 of his Direct Testimony (DOC Ex. 808) reflect the six actual plants in addition to the 87 county values based on the modeling of hypothetical plants. Thus, for the six counties in which one of the six modeled plants is located, there are two sets of damage values, one for the actual plant and one for a hypothetical plant located at the county centroid, so in a sense, these six counties have twice as much weight in the calculation of averages. In Table 6, Dr. Muller presented the averages and ranges for all 93 Minnesota sources for each pollutant under low- and

⁴ The Agencies do not agree that the three hypothetical plants chosen by Dr. Desvousges accurately or sufficiently capture the vast amount of heterogeneity of damage costs across the state. That is to say, that the damage values from one hypothetical plant, the Black Dog plant, for example, are not an accurate representation of the damages from emissions from all urban areas in the state. Dr. Muller showed and explained the substantial heterogeneity in damage values in his testimony (see, for example, DOC Ex. 810 at 5-6 (Muller Rebuttal)), which are not captured by the three hypothetical plants modeled by Xcel.

high-damage value assumptions. He provided this information, and other summary tables, for illustrative purposes, to give the ALJ and the Commission a sense of the average values and ranges of values rather than as precise summations of his results to be directly applied in the setting of damage cost values. In contrast, in the maps that he provided, (for example, Muller Direct, (DOC Ex. 808) Figure 5 on page 53 and Figure 6 on page 56) Dr. Muller showed how different sources of primary PM_{2.5} fell into various (color-coded) ranges of damage values, and he separated hypothetical county sources (Figure 5) from actual “Individual Power Station” sources (Figure 6). The Agencies recommend that the Commission not adopt Conclusion of Fact No. 19.

In response to Conclusion of Fact No. 21 (page 96), the Agencies continue to assert that Dr. Muller’s application of the Boylan and Russell performance standards can be relied upon to support the reasonableness and validity of AP2 modeling results; however, the Agencies note that the Commission need not draw any conclusions on this point since the ALJ Report recommends use of AP2 should the Commission choose to establish county-by-county values.

II. SPATIAL SENSITIVITY: SOURCES AND SOURCE LOCATIONS

In Conclusion of Fact No. 30 (page 98) the ALJ Report questions the Agencies’ choice to model a large number of sources outside of Minnesota. If the Commission determines that the information provided by the Agencies for out-of-state sources is not useful, the Commission is free to disregard it. The Agencies chose to estimate values for sources outside of Minnesota, but within 200 miles of the State’s borders, based in part on the Commission’s determinations in Docket No. E999/CI-93-583. The Commission’s reasoning at the time was that sources in this band around the State are likely to provide power to Minnesota electricity consumers and are likely to impact Minnesota with their emissions. Incorporating nearly 400 out-of-state sources and source locations within the 200-mile area was neither burdensome nor confusing; use of a

reduced-form model such as AP2 allows for the necessary modeling runs to be accomplished in a quick and cost-effective manner. The information produced by the modeling runs would be useful to the Commission, and Dr. Muller's Testimony explained several ways in which the information could be aggregated or grouped, and simplified. DOC Ex. 811 at 27 (Muller Surrebuttal).

The Agencies recommend that Conclusion of Fact No. 31 not be adopted because it is erroneous and misleading.⁵ The chemical transport modeling for the State of Minnesota's Regional Haze State Implementation Plan, prepared using CAMx, has shown significant impacts of PM_{2.5} in Minnesota from emission sources in other states to the Southeast.⁶ Impacts can vary significantly based on meteorology during a particular year.

While Conclusion of Fact No. 32 may appear to simplify the issues before the Commission at this time, such an approach inadvertently overlooks important facts in planning for new resources. The Agencies note that integrated resource planning involves choosing the least-cost suite of demand- and supply-side resources to meet customer load. Should the Commission determine that a new supply-side resource is needed, the location of that new resource is typically not known, and could be located outside of Minnesota in a location where no plant currently exists. Restricting the consideration of impacts of an integrated resource planning decision by assuming that a new supply-side resource, if located outside of Minnesota, would be in a source location where a plant currently exists is a simplification that may not be

⁵ The Agencies note that Conclusion of Fact No. 31's footnoted reference to Finding 43 may be a typographical error. The intended reference may be to Finding 33.

⁶ *Minnesota Regional Haze SIP Minnesota Technical Support Document* (MPCA 2009), published by the EPA at <https://www.regulations.gov/document?D=EPA-R05-OAR-2010-0037-0004>

necessary given current modeling capabilities. The Agencies recommend that Conclusion of Fact No. 32 on page 98 be amended, to read:

32. The Administrative Law Judge concludes that the Commission's understanding of impacts from emissions produced outside the state ~~does not require~~ would benefit from modeling of source locations outside of Minnesota, including locations where there are currently no active plants. ~~Should such a plant be built in the future, the Administrative Law Judge concludes that the Commission can substitute the emissions costs from an existing (or hypothetical) source to estimate the effect of a new plant.~~

The Agencies recommend that the Commission refrain from adopting Conclusion of Fact No. 33 unless it is clarified or corrected. In Conclusion of Fact No. 33 (pages 98-99), the ALJ Report appears to conclude that there is missing information in the record, "should the Commission choose to include out-of-state impacts as well as out-of-state sources in the externality values." However, should the Commission make such a choice, Conclusion of Fact No. 33 also indicates that the Agencies have not demonstrated how damages from out-of-state sources to out-of-state locations will be *prevented* from being reflected in the externalities values. Assuming that the word "not" was inadvertently omitted, such that the Conclusion should read, ". . . should the Commission choose not to include out-of-state impacts as well as out-of-state sources," it is true that the Agencies did not disaggregate damages within Minnesota from damages outside the state for out-of-state sources, but note that AP2 could be configured to produce those results.

As to the Commission's choice whether to consider damages to out-of-state locations caused by out-of-state sources, the Agencies observe that in Docket E999/CI-93-583 the Commission limited quantification of damages to those occurring within Minnesota whether the source was located within or outside (within 200 miles) Minnesota. Whether that remains a valid limitation is not clear. The fact remains that, to fully internalize an external cost, and thus to

have accurate information on which to make resource decisions, all damages should be counted regardless of state boundaries.

So, while the Agencies did not provide information on the proportion of damages in Minnesota relative to the damages outside of Minnesota, they chose not to do so because the purpose of this proceeding is to determine the damages caused by sources used to serve Minnesotans. This analysis relied on the fact that “[e]mission levels affect marginal damage values by impacting background ambient concentrations.” DOC Ex. 808 at 47 (Muller Direct). As a result, the analysis of the impact of one more ton of emissions from a source serving Minnesota requires consideration of the level of ambient pollution, regardless of the sources of the pollution. Disaggregating the effects of pollution from other sources would not serve a useful purpose in decisions before the Commission.

In Conclusion of Fact No. 35 (page 99) the ALJ Report finds the Agencies’ county-by-county source approach unreasonable because the Commission has not required or expressed a need for this level of detail in resource planning, certificate of need, or related proceedings. The Agencies did not advocate specifically for the use of separate values for every county; rather, this is how the AP2 model works. DOC Ex. 808 at 20 (Muller Direct). These county-level values can be aggregated in various ways, as Dr. Muller expressed multiple times in his testimony, giving the Commission a great deal of versatility in how to apply them. DOC Ex. 811 at 25-26 (Muller Surrebuttal). This versatility is a significant strength of the AP2 model.

Furthermore, the fact that the Commission did not direct the parties to provide a certain level of detail does not make that level of detail unreasonable. The Commission simply provided no pre-conceived instruction as to granularity and left it to the parties to develop a record in the

contested case process to support their proposed levels of granularity. The Agencies recommend that the Commission not adopt Conclusion of Fact No. 35.

In Conclusion of Fact No. 36, the ALJ Report correctly points out the crudeness of AP2's estimates of the proportion of damages from NO_x emissions that are out of state. Dr. Muller acknowledged this crudeness and indicated that he provided these estimates not to precisely quantify the extent of out-of-state damages but instead to *qualitatively* corroborate the correctness of the conclusion that a significant proportion of the damages are out-of-state. Tr. Vol. 8 at 104-110. The ALJ Report agrees with this conclusion in Conclusion of Fact No. 37 (pages 99-100) where she notes "...that the preponderance of the evidence demonstrates that SO₂ and NO_x can travel significant distance, forming secondary PM_{2.5} hundreds of miles from the source from which they were emitted." In light of this correct conclusion, the Agencies propose the following minor revision to the last sentence of Conclusion of Fact No. 36: "The Agencies relied on data that is insufficient~~unreliable~~ for the present purpose."

Conclusion of Fact No. 37 (pages 99-100) lacks clarity and seems to have mixed messages. As noted above, the ALJ Report correctly concludes that the evidence demonstrates that SO₂ and NO_x can travel significant distances, causing impacts hundreds of miles from their sources. The fact that the Agencies did not undertake in the contested case record to precisely determine what proportion of impacts are out-of-state as opposed to in-state does not diminish this conclusion and should not undermine it. The Agencies propose that the Commission change the last sentence of this Conclusion to:

The Administrative Law Judge concludes that the preponderance of the evidence failed to demonstrate the precise percentages of SO₂, and NO_x emitted in Minnesota that cause impacts and damages outside the state of Minnesota ~~because the Agencies relied on skewed data to demonstrate that two thirds of NOx emissions from Minnesota cause damages outside of Minnesota.~~

III. GEOGRAPHIC SCOPE OF DAMAGES

III. Geographic Scope of Damages

In Conclusion of Fact No. 44 (page 101) the Agencies maintain that the ALJ Report -- perhaps understandably, given the complexity of the various parties' assertions--fails to accurately assess the evidence regarding guidance of the federal Environmental Protection Agency (EPA) on the use of reduced-form models to estimate impacts at distances farther than 50 kilometers from an emissions source. In particular, the EPA air quality modeling guidelines relied upon by Xcel⁷ (*EPA Guideline on Air Quality Models*), is inapposite. Xcel claimed that these guidelines stated that "relying on a steady-state Gaussian plume model", such as AP2, is appropriate to use when modeling impacts from a source to receptors located up to 50 kilometers away, but not appropriate for modeling impacts greater than 50 kilometers from emissions sources. Xcel Ex. 605 at 21 (Desvousges Rebuttal). The MPCA believes that a common misconception is that air dispersion models' practical limits or applicable scale are based on how pollutants are distributed within the plume or puff; but this is not the case.; many regulatory models for both near (less than 50 kilometers) and far field (greater than 50 kilometers) dispersion modeling employ the Gaussian distribution as this is used to represent where the highest concentrations exist in a plume volume.

In summary, the EPA guidance cited by Xcel was not intended for reduced-form modeling. Appendix A the the *EPA Guideline on Air Quality Models* contains summaries of refined air quality models that are "preferred" for the specific regulatory applications with which the EPA was concerned in its *EPA Guideline on Air Quality Models*.; none are reduced

⁷ *EPA Guideline on Air Quality Models*, 40 C.F.R. Part 51, Appendix W, [Revision to Guideline on Air Quality Models, Final Rule, 70 Fed. Reg. 68229 - 68253 at 68249 (Nov 9, 2005)].

form models.⁸ The Agencies are not aware of any EPA guidance regarding the use of reduced-form modeling for impacts greater than 50 kilometers from the emissions source. For this docket, the Agencies were charged with estimating marginal downwind impacts from the emission of each additional ton of air pollution from one source at a time, and the EPA guidance is not dispositive for assessing the ability of a reduced-form model to perform that task. The Agencies recommend that the Commission find that a reduced-form model, and specifically AP2, is a suitable tool for the job at hand, and that the Commission not adopt Conclusion of Fact No. 44.

Conclusion of Fact No. 45 (page 101) requires clarification. The ALJ Report appears to conclude that the incremental damage caused by a Minnesota source to a non-Minnesota location significantly impacted by emissions from a non-Minnesota source should be adjusted to reflect the incremental damage had the non-Minnesota location not been impacted by the non-Minnesota source. It is unclear, however, whether the phrase “Minnesota sources” refers to sources located in Minnesota or sources serving Minnesota, since sources serving Minnesota could be located outside Minnesota. For the purposes of Conclusion of Fact No. 45, the Agencies interpret the phrase “Minnesota source” to mean sources serving Minnesota. If this interpretation is correct, the Agencies note that the models used in this proceeding were designed to estimate damages based on assumptions intended to mimic reality to the extent possible (in the opinion of the model creator and to the extent the model allows). If a location is impacted by a high level of ambient emissions, that level of emissions should be reflected in the model in order

⁸ The models to which the *EPA Guideline on Air Quality Models*, apply include EPA models and models developed by others, including: Aermid Buoyant Line and Point Source Dispersion Model (BLP), CALINE3, CALPUFF; Complex Terrain Dispersion Model Plus Algorithms for Unstable Situations (CTDMPLUS), and Offshore and Coastal Dispersion Model (OCD). EPA Guideline on Air Quality Models, Appendix A to Appendix W, 70 Fed. Reg. 68229 at 68253.

to properly project the damages from an incremental ton of emissions. Therefore, the Agencies respectfully disagree with the conclusion that out-of-state sources of pollution must be excluded from the externality values for receptor sites outside Minnesota affected by Minnesota sources, and, accordingly, recommend that the Commission not adopt Conclusion of Fact No. 45. If the Commission chooses to adopt Conclusion of Fact No. 45, then, in the interest of clarity, the Agencies recommend that the Commission not adopt the following sentence:

For example, if a power plant in Wisconsin injects significant amounts of O₃ or NO_x into the Chicago area, and the Sherco plant contributes a small additional amount of NO_x to the Chicago area, the Sherco plant is not increasing the ambient concentration of PM_{2.5} in Chicago to the same extent it is likely increasing the ambient PM_{2.5} in Chicago.

IV. MISCELLANEOUS MATERIAL ERRORS AND OMISSIONS IN THE PROCEDURAL HISTORY AND FINDING OF FACTS

To improve clarity and accuracy of the ALJ Report, the Agencies propose the following corrections to the ALJ Report's Findings of Fact:

- The first sentence of Finding of Fact No. 1 on page 8 should read: "The task of the Administrative Law Judge in the present portion of this matter is to review and synthesize information related to the impacts and damages caused by emissions of PM_{2.5}, ~~CO₂~~SO₂, and NO_x (the criteria pollutants, or CPs)."
- Finding of Fact No. 206 on pages 65-66 erroneously states that the values established in the First Externalities case in the 1990s applied the three-tiered geographical structure (urban, metropolitan fringe, rural) to locations outside of Minnesota, but within 200 miles of the state border. In fact, all locations outside of Minnesota, but within 200 miles of state borders were deemed to have the same values as rural areas of Minnesota. The sentence starting at the bottom of page 65 should be amended to: "Xcel pointed out that the Commission established the three-tiered urban, metropolitan fringe, and rural structure for CP values in the First Externalities case, applying it to all locations within Minnesota. The Commission opted to apply the Minnesota rural values as well as to locations outside of Minnesota, but within 200 miles of the state border." Xcel Ex. 605 at 27 (Desvousges Rebuttal).
- The first sentence of Finding of Fact No. 221 on page 71 should read: "While the Agencies continued to disagree with the CEOs' choice of 0.78 for the concentration-response value, the Agencies agreed that this is a matter of professional judgment and noted that the CEOs value falls within the range recommended by the ~~CEOs~~Agencies."

- Conclusion of Law No. 3. a. on page 93 should read: “A party or parties proposing that the Commission adopt a new environmental cost value for PM_{2.5}, CO₂SO₂, or NO_x, bears the burden of showing by a preponderance of the evidence that the value being proposed is reasonable, practicable, and the best available measure of the environmental costs of PM_{2.5}, CO₂SO₂, or NO_x”.

RECOMMENDATIONS

Based on the reasoning above, the Agencies request that the ALJ Report be amended as follows:

- Finding of Fact No. 1 on page 8 should be amended, to read:
 1. The task of the Administrative Law Judge in the present portion of this matter is to review and synthesize information related to the impacts and damages caused by emissions of PM_{2.5}, ~~CO₂~~SO₂, and NO_x (the criteria pollutants of CPs).
- The last sentence of Finding of Fact No. 206 on page 66 should be amended, to read:

206. Xcel pointed out that the Commission established the three-tiered urban, metropolitan fringe, and rural structure for CP values in the First Externalities case, applying it to all locations within Minnesota. The Commission opted to apply the Minnesota rural values as well as to locations outside of Minnesota, but within 200 miles of the state border.
- Finding of Fact No. 221 on page 71 should be amended, to read:

221. While the Agencies continued to disagree with the CEOs' choice of 0.78 for the concentration-response value, the Agencies agreed that this is a matter of professional judgment and noted that the CEOs value falls within the range recommended by the ~~CEOs~~Agencies. Therefore, the Agencies did not fundamentally disagree with the CEOs' recommended value.
- Conclusion of Law No. 3. a. on page 93 should be amended, to read:

3. A party or parties proposing that the Commission adopt a new environmental cost value for PM_{2.5}, ~~CO₂~~SO₂, or NO_x, bears the burden of showing by a preponderance of the evidence that the value being proposed is reasonable, practicable, and the best available measure of the environmental costs of PM_{2.5}, ~~CO₂~~SO₂, or NO_x”
- Conclusion of Fact No. 15 on page 95 should be amended, to read:

15. The Administrative Law Judge concludes that the Agencies ~~failed to~~ demonstrated by a preponderance of the evidence that modeling individual pollutants separately is an approach commonly used in this field. The Administrative Law Judge

further concludes, based on Xcel's comparative damage results, that AP2's modeling of pollutants separately did not appear to result in overstatement of nitrate formed.⁹

- Conclusion of Fact #No. 17 on page 95 should be amended, to read:

17. The Administrative Law Judge concludes that, while not a reasonable approach to use to update the values, the Agencies' proposal to update projections of the CP externalities values for future years by using a formula that projects changes in populations and mortality rates but holds emissions constant provides a useful indicator of how values may change over time is not a reasonable approach. ~~There is no reason to believe that emissions will remain constant. Given that emissions drive mortality rates in this context, and that mortality rates have the largest impact on damages, the Administrative Law Judge concludes that the Agencies' update proposal will not result in reliable updates for CP externalities.~~

- Conclusion of Fact No. 18 on page 95 should not be adopted.
- Conclusion of Fact No. 19 on page 95 should not be adopted.

- Conclusion of Fact No. 30 on page 98 should be amended, to read:

30. ~~The Administrative Law Judge concludes that the Agencies' statement that it is necessary to model sources outside the state if the Commission wishes to know what the impacts are from emissions produced outside the state, does not require the Commission to adopt externalities values in this proceeding which include almost 400 sources and source locations outside Minnesota's borders, a number which makes including outside sources and source locations cumbersome and potentially confusing.~~ Incorporating nearly 400 out-of-state sources and source locations is not particularly burdensome or confusing because use of a reduced-form model such as AP2 allows for the necessary modeling runs to be accomplished in a quick and cost-effective manner. The information produced by the modeling runs could be useful to the Commission, and Dr. Muller's Testimony suggested several ways in which the information could be aggregated or grouped, and simplified.

- Conclusion of Fact No. 31 on page 98 should not be adopted.
- Conclusion of Fact No. 32 on page 98 should be amended, to read:

32. The Administrative Law Judge concludes that the Commission's understanding of impacts from emissions produced outside the state ~~does not~~

⁹ Citation omitted. This Exceptions Brief omits citations in the ALJ Report, except as specifically noted herein.

~~require would benefit from modeling of source locations outside of Minnesota, including locations where there are currently no active plants. Should such a plant be built in the future, the Administrative Law Judge concludes that the Commission can substitute the emissions costs from an existing (or hypothetical) source to estimate the effect of a new plant.~~

- Conclusion of Fact No. 33 should not be adopted, or, alternatively, the Commission should clarify and amend the Conclusion as follows:

33. The Administrative Law Judge concludes that, in suggesting three approaches to using the damage costs for the out-of-state sources, the Agencies have not demonstrated how they will prevent the CP externalities values for these locations from including damages to out-of-state locations caused by out-of-state sources, should the Commission choose not to include out-of-state impacts as well as out-of-state sources. ~~For example, the Agencies have not demonstrated how damages in a Chicago receptor location attributed to a source location in Wisconsin will not be included in Minnesota CP externalities numbers.~~

- Conclusion of Fact No. 35 should not be adopted by the Commission.
- The last sentence of Conclusion of Fact No. 36 on page 99 should be amended, to read:
The Agencies relied on data that is ~~unreliable~~ insufficient for the present purpose.

- Conclusion of Fact No. 37 on page 100 should be amended to:

37. The Administrative Law Judge concludes that the preponderance of the evidence demonstrates that primary PM_{2.5} causes damages which are mostly local and regional. The Administrative Law Judge concludes that the preponderance of the evidence demonstrates that SO₂, and NO_x can travel significant distances, forming secondary PM_{2.5} hundreds of miles from the source from which they were emitted. The Administrative Law Judge concludes that the preponderance of the evidence failed to demonstrate the precise percentages of SO₂, and NO_x emitted in Minnesota that cause impacts and damages outside the state of Minnesota ~~because the Agencies relied on skewed data to demonstrate that two thirds of NO_x emissions from Minnesota cause damages outside of Minnesota.~~

- Conclusion of Fact No. 44 should not be adopted by the Commission.
- Conclusion of Fact No. 45 on page 101 should not be adopted by the Commission. At a minimum, Conclusion of Fact No. 45 should be clarified as follows:

45. The Administrative Law Judge concludes that, regardless of the specific standards established by the federal Cross State Air Pollution Rule, the extent to

which the CP damage costs for a receptor located in another state is fueled by sources outside of Minnesota is relevant to determining how much Minnesota sources are contributing to the other state's CP damage costs. ~~For example, if a power plant in Wisconsin injects significant amounts of O₃ or NO_x into the Chicago area, and the Shereo plant contributes a small additional amount of NO_x to the Chicago area, the Shereo plant is not increasing the ambient concentration of PM_{2.5} in Chicago to the same extent it is likely increasing the ambient PM_{2.5} in Chicago.~~ Put another way, but for the pollutants coming from Wisconsin, the NO_x traveling to the Chicago area from Sherco might result in much smaller increases in ambient PM_{2.5} concentration. Therefore, the Administrative Law Judge concludes that, if damages are based on ambient concentrations at receptor sites outside of Minnesota based on Minnesota sources and source locations, then any out-of-state sources of pollution must be excluded from the Minnesota damage costs.

CONCLUSION

For the reasons stated above, and consistent with its testimony, post-trial briefs and proposed facts in this matter, the Agencies respectfully recommend that the Commission adopt the ALJ's Findings of Fact, Conclusions and Recommendations: Criteria Pollutants, with the clarifications, exceptions and amendments discussed herein.

Dated: July 15, 2016

Respectfully submitted,

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July 15, 2016

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RE: In the Matter of the Further Investigation in to Environmental and Socioeconomic Costs
Under Minnesota Statute 216B.2422, Subdivision 3
PUC Docket No. E-999/CI-14-643;
OAH Docket No. 80-2500-31888

Dear Mr. Wolf:

Enclosed for filing please find Clarifications and Exceptions of the Minnesota Department of Commerce, Division of Energy Resources, and the Minnesota Pollution Control Agency – Criteria Pollutants in the above referenced matter.

Respectfully submitted,

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Enclosure
cc: Service List

AFFIDAVIT OF SERVICE

RE: In the Matter of the Further Investigation in to Environmental and Socioeconomic Costs Under Minnesota Statute 216B.2422, Subdivision 3 (2014)
PUC Docket No. E-999/CI-14-643;
OAH Docket No. 80-2500-31888

STATE OF MINNESOTA)
) ss.
COUNTY OF RAMSEY)

I, Annabel Foster Renner, hereby state that on the July 15, 2016, I filed by electronic eDockets the attached **Clarifications and Exceptions of the Minnesota Department of Commerce, Division of Energy Resources and the Minnesota Pollution Control Agency – Criteria Pollutants** and eServed or sent by US Mail, as noted, to all parties on the attached service list.

See attached service list for PUC Docket No. E-999/CI-14-643;
OAH Docket No. 80-2500-31888

/s/ **Annabel Foster Renner**
ANNABEL FOSTER RENNER

Subscribed and sworn to before me on
this 15th day of July, 2016.

/s/ **LaTrice Woods**
Notary Public – Minnesota
My Commission Expires January 31, 2020.

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