APPENDIX 7: COMMENTS AND RESPONSES ON PROPOSED 2016 MONITORING NETWORK PLAN, REVISION 1

The Missouri Department of Natural Resources' Air Pollution Control Program (Air Program) posted the 2016 Monitoring Network Plan (initial plan) for public inspection May 27, 2016 through June 28, 2016. Due to several changes in the monitoring network, the Air Program provided a public inspection period from November 15, 2016 to December 15, 2016 for the 2016 Monitoring Network Plan Revision 1 (revised plan).

The Air Program prepared the 2016 Monitoring Network Plan (initial and revised plans) to address the requirements of 40 CFR 58.10 (a) (1) for annual submittal of a plan to provide information on current State or Local Air Monitoring Stations (SLAMS), other ambient air monitoring, and any proposed network changes for the upcoming year.

Based on comments received, no substantive changes were made to the revised plan. One change was made to a label in the map on page 18 of the plan. The Mark Twain State Park site label was corrected to "site #19" to match the map legend.

SUMMARY OF COMMENTS: The following is a summary of comments received on the revised plan and the Air Program's responses. The Air Program appreciates all input and feedback received. However, several comments received were outside the scope of this plan and the responses are limited to the comments specifically on the monitoring activities described in the plan.

During the public inspection period of the revised plan, the Air Program received comments from Dr. Michael Garvey, St. Charles MO; Jeanne Clauson, Chesterfield MO; Maxine Lipeles (Washington University School of Law on behalf of the Sierra Club); Patricia Schuba, President, Labadie Environmental Organization; Steven C. Whitworth, Ameren Missouri; Daniel Hedrick, City of Springfield Utilities and Joe Brazil, St. Charles County Council.

COMMENT 1:
Dr. Michael V. Garvey commented: "*I appreciate the opportunity to make comment on the Labadie air quality analysis.*

We have a major public health air quality problem which is likely to become more of a problem in the immediate future with all coal fired emissions. The Labadie plant has been negatively impacting my public health, in addition to the health of my patients and neighbors now for 47 years. SO2 and small particulate contamination have real impacts on air quality as you are well aware. Ameren worked back in 1970 to quickly get the plant approved in the last year before "scrubbers" were required and have successfully been avoiding this most reasonable public health measure for 47 years!

I want to know specifically who from the MoDNR approved the "poor" prior locations of the two monitors Ameren placed? How could this have been done with the locations not in areas expected to pick up the SO2 based upon DNR's own modeling plan? Modeling, which is the best way to determine compliance scientifically, was fully expected to give a final "non-attainment"

designation. You do not place a monitor on the valley floor well below the top of the smoke stack! The second monitor was purposefully placed behind trees and high elevations which would block the SO2. These monitors are well away from the most likely locations as determined by the modeling done by MoDNR? I also want to know who from the MoDNR will approved the new locations of the two monitors?

The best location would be on the first high bluffs down from the prevailing wind on the Missouri River flood plain. Ameren well knows how to Delay, Delay and Delay. Now we have another 3 years of delay before any decision will be made. They well intend to run that plant until is effective life is gone without scrubbers and the DNR are aiding them in this deceptive plan

Please include me in the emails sent out giving the actual SO2 emissions data results from all 4 monitors."

COMMENT 2:
Jeanne Clauson commented: "*Surely after so many years, the area of wind drift is known. Can you not insist that the equipment be located where the fallout of sulphur dioxide would be affecting people and ponds under the areas of wind drift?*

Ameren gets three more years before having to own up to sulphur dioxide pollution. They need to play fair and put the monitors where they belong if they are to enjoy any respect. Come on, they know and we know they aren't the only miracle plant in the country that doesn't need scrubbers.

Another side of Ameren played fair with me when I received the rebates for installing my solar panels 3 years ago. The intricate billing information I receive monthly shows the deductions for my solar contribution and keeps track of how my energy usage has changed from the previous year.

I hope that Ameren can come around and appreciate that they will gain some respect if they put their monitors where they should be placed. It is time to do that! Surely they will appreciate respect over scorn."

RESPONSE TO COMMENTS 1 AND 2:
The locations of the first two monitoring stations (Valley and Northwest) near the Labadie Energy Center were selected utilizing air quality modeling with meteorological data available at the time (see 2015 Monitoring Network Plan), http://dnr.mo.gov/env/apcp/docs/2015-monitoring-network-plan.pdf. The two new monitoring sites (Southwest and North) were selected utilizing modeling with new location-specific meteorological data obtained onsite from one of the first two monitoring stations (see Appendix 5). Modeling and the recommendation of potential monitoring sites were done collaboratively by Air Program and EPA staff. Specific locations consistent with these recommendations were then secured and developed by Ameren Missouri.

Although the Air Program does not email actual monitoring data on a weekly basis, the program does track and post concentrations of the six common pollutants, including SO_2, on the following website weekly: http://dnr.mo.gov/env/apcp/airpollutants.htm

COMMENT 3 and 4:
The Sierra Club submitted four main comments regarding the monitoring surrounding Ameren Missouri Labadie and Rush Island Energy Centers. The comments below are the main points, quoted from the submittal. The complete Sierra Club comment document is attached to this appendix.

Sierra Club commented: "*Even with the two new monitors, the Revised Plan fails to cover an expected peak SO_2 concentration area southeast of Labadie. Ameren's own recent modeling, using on-site meteorological data, strongly supports a monitor in this location. The addition of a monitor southeast of Labadie is critical to monitoring all significant areas around Labadie where peak 1-hour SO_2 concentrations are expected to occur."*

Sierra Club commented: *"The Revised Plan continues to include two monitors, the Valley and Northwest Monitors, which are not sited in areas of expected peak SO_2 concentrations and therefore are not suited for NAAQS compliance monitoring."*

RESPONSE TO COMMENT 3 and 4:
The Data Requirements Rule (DRR) and the EPA Monitoring Technical Assistance Document (TAD) do not specify a minimum number of monitoring sites needed to characterize sources for the 1-hour SO_2 National Ambient Air Quality Standard (NAAQS).

The Preamble to the DRR states: "Potential ambient air monitoring costs are estimated based on the assumption that air quality for each of the 412 SO_2 sources exceeding the 2,000 tpy threshold would be characterized through a single newly deployed air monitor. (The Monitoring TAD discusses situations where more than one monitor may be appropriate or necessary to properly characterize peak 1-hour SO_2 concentrations in certain areas, which would increase costs proportionally.)" Federal Register Vol. 80, No. 1621 Friday, August 21, 2015, page 51085.

Consistent with the Data Requirements Rule, the Air Program determined the number of monitoring sites for these areas using a case-by-case technical evaluation as described in the monitoring plan. The characteristics and complexity of the areas around the facilities indicate that multiple monitoring sites are appropriate in these areas for additional spatial coverage as suggested in the EPA Monitoring TAD Page A-10: "Even in situations where the measured concentrations at any given monitor are not the peak values that would be driving the design values in the area, the characterization of SO_2 concentrations around the SO_2 source are enhanced, furthering the understanding of exposures and dispersion in that area. This data will allow for a more complete understanding of the likely SO_2 concentration gradients in an area, increased understanding of the frequency at which certain locations see SO_2 concentration maxima, and increased detail and confidence in any NAAQS determination activity."

The Valley and Northwest sites were established utilizing air quality modeling with meteorological data available at the time (see the 2015 Monitoring Network Plan.), http://dnr.mo.gov/env/apcp/docs/2015-monitoring-network-plan.pdf. Subsequently, the Southwest and North sites were selected utilizing modeling with new location-specific meteorological data obtained onsite from one of the first two monitoring stations (see Appendix 5). As detailed in EPA's Monitoring TAD, monitors at sites other than the point of maximum

modeled concentration are still useful in characterizing the air quality in an area. Therefore, the Labadie Valley and Northwest sites will continue operation in addition to the enhanced network that includes the two new locations, Southwest and North.

For additional information on this topic, please refer to the Air Program's responses to Sierra Clubs comments on the 2015 Monitoring Network Plan, http://dnr.mo.gov/env/apcp/docs/2015-monitoring-network-plan.pdf and on the initial 2016 Monitoring Network Plan.

COMMENT 5:
Sierra Club commented: *"In light of the requirement in the Data Requirements Rule that the monitors begin collecting data by January 1, 2017, we urge DNR to finalize and EPA to approve the Revised Plan expeditiously. We understand that DNR, EPA, and Ameren have already agreed to the two new monitor locations. While we support the location of the two new monitors based on currently-available information, we object that the public was excluded from the discussions regarding new monitor locations and that this public comment period comes far too late in the process for public input to be taken seriously."*

RESPONSE TO COMMENT 5:
The Air Program appreciates Sierra Club's support of the location of the two monitors around the Labadie plant and the recommendation that EPA approve the revised plan expeditiously.

The Air Program relies on and follows the federal regulation which requires making available the annual monitoring network plan for public inspection and comment for at least 30 days prior to submission to the EPA.

The Air Program appreciates all public input on our activities and strives to keep the public informed on our activities through email list serves and other communications. We reviewed numerous letters and comments received on this topic prior to the public inspection period. The Air Program gave regular updates on this issue to the Missouri Air Conservation, whose meetings are livestreamed with meeting minutes available on the web.

COMMENT 6:
Sierra Club commented: *"The Revised Plan makes no changes regarding the monitors around Ameren's Rush Island plant even though two of the monitors are not in peak concentration areas."*

RESPONSE TO COMMENT 6:
The Air Program addressed this issue in response to Sierra Club's comments regarding the 2015 Monitoring Network Plan, http://dnr.mo.gov/env/apcp/docs/2015-monitoring-network-plan.pdf, and in the response to comments on the initial 2016 Monitoring Network Plan.

The monitoring network around the Rush Island Energy Center is not designed to meet the requirements of the Data Requirements Rule. However, the guidelines for DRR monitoring may still be pertinent. The EPA Monitoring TAD Page A-10 states: "Even in situations where the measured concentrations at any given monitor are not the peak values that would be driving the

design values in the area, the characterization of SO_2 concentrations around the SO_2 source are enhanced, furthering the understanding of exposures and dispersion in that area. This data will allow for a more complete understanding of the likely SO_2 concentration gradients in an area, increased understanding of the frequency at which certain locations see SO_2 concentration maxima, and increased detail and confidence in any NAAQS determination activity."

COMMENT 7:
Patricia Schuba commented: *"Please consider an additional SO2 monitor SE of the Ameren Labadie stacks given it is also an area of potential exceedence of the SO2 1 hr NAAQS, where many people live, and where many of us send our children to school. (The Fulton School, St. Albans). Previous modeling showed areas S and SE of the plant as also areas potentially exposed to maximal SO2 concentrations.*

The locations of the proposed monitors appear to be in areas of maximum SO2 concentrations (Monitors: SW, N) while the first two monitors sited by Ameren (Monitors: NW and Valley) are not in areas of maximum SO2 concentrations as acknowledged by US EPA.

Thank you for your time, service and consideration of our comments. Please think of the need for accurate and complete data and the obvious impact on our communities."

RESPONSE TO COMMENT 7:
Please see the response to Comment 1 through 4 above regarding the rationale for the number and location of monitoring sites.

COMMENT 8 and 9:
The complete Ameren comment letter is attached to this appendix.
Steven C. Whitworth commented (in summary): *Ameren supports the addition of two additional monitoring sites to the network around the Labadie Energy Center. Ameren is committed to continue to operate the networks around the Labadie and Rush Island Energy Centers consistent with the requirements of 40 CFR Part 58, the state-approved Quality Assurance Project Plans, and the Data Requirements Rule to determine whether the areas are in compliance with the SO_2 NAAQS. Ameren notes that SO_2 concentrations measured to date near both facilities are well below the level of the NAAQS.*

Daniel Hedrick commented: "*City Utilities of Springfield, Missouri (CUS) supports the Missouri Department of Natural Resources (MDNR) revisions to the Monitoring Network Plan. CUS believes the proposed changes are consistent with the quality-assured ambient air quality data. We appreciate this opportunity to submit comments on behalf of the utility. Thank you."*

RESPONSE TO COMMENTS 8 and 9:
The Air Program appreciates the support of the Monitoring Network Plan.

COMMENT 10:
Joe Brazil, St. Charles County Council, commented:
"*The citizens in southern St. Charles county truly appreciate the EPA taking another look at the inclusion of two new monitors, one N of the plant in St Charles County and one SW of the plant*

in Franklin County. These appear based on currently-available data to be in areas of maximum SO2 concentrations.
It should be seriously considered that one more monitor should be added to the SE of the plant, another area of maximum SO2 concentrations without any monitor coverage.
As EPA noted in its Response to Comments regarding the Labadie designation decision, the first two monitors previously sited by Ameren (labeled the Northwest and Valley monitors) are NOT in areas of maximum SO2 concentrations.

We also would like to see that immediate action for DNR to send the plan to EPA and for EPA to approve because the two new monitors must be online by Jan 1, 2017.
Again it is truly appreciated that you are working with us and that we can get some resolve on this issue.

RESPONSE TO COMMENTS 10
Please see the responses above to Comments 1 through 7.

Washington University in St. Louis
SCHOOL OF LAW
Interdisciplinary Environmental Clinic

December 14, 2016

Missouri Department of Natural Resources
Air Pollution Control Program
Air Quality Analysis Section/Air Monitoring Unit
P.O. Box 176
Jefferson City, MO 65102
Via email to: cleanair@dnr.mo.gov

Re: 2016 Monitoring Network Plan, Revision 1 (November 15, 2016)

To whom it may concern:

On behalf of the Sierra Club, we submit these comments on the Missouri Department of Natural Resources' ("DNR") 2016 Monitoring Network Plan, Revision 1 dated November 15, 2016 ("Revised Plan"). The Revised Plan adds sulfur dioxide ("SO_2") monitors southwest and north of the Labadie Energy Center that, based on the best information currently available, appear to be sited in areas of expected peak 1-hour SO_2 concentrations. We appreciate these additions to the monitoring network plan given our and EPA's[1] previously-stated position that neither of Ameren's current Labadie monitors is in an area of maximum SO_2 concentrations as required by EPA regulations.[2] Identifying areas of SO_2 nonattainment around the Labadie plant is critical because the plant is the largest coal plant in the nation without SO_2 controls and SO_2 poses significant public health risks for children, the elderly, and asthmatics.[3]

This letter makes four additional points:

1. Even with the two new monitors, the Revised Plan fails to cover an expected peak SO_2 concentration area southeast of Labadie. Ameren's own recent modeling, using on-site meteorological data, strongly supports a monitor in this location. The addition of a monitor southeast of Labadie is critical to monitoring all significant areas around Labadie where peak 1-hour SO_2 concentrations are expected to occur.

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[1] EPA, Responses to Significant Comments on the Designation Recommendations for the 2010 Sulfur Dioxide Primary National Ambient Air Quality Standard (NAAQS), Docket Number EPA-HQ-OAR-2014-0464 (June 30, 2016) ("Response to Comments") at 79-87, available at https://www.epa.gov/sites/production/files/2016-07/documents/so2d-r2-response-to-comments-06302016.pdf.

[2] Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS), 80 Fed. Reg. 51052 (Aug. 21, 2015), *codified at* 40 C.F.R. §§ 51.1200 – 51.1205.

[3] EPA, Sulfur Dioxide Basics, available at https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects. SO_2 emissions also contribute to dangerous fine particle pollution. See, e.g., Clean Air Task Force, *The Toll From Coal* (Sept. 2010), available at http://www.catf.us/resources/publications/files/The_Toll_from_Coal.pdf ("Sulfur emissions from coal-fired power plants thus emerge as the chief driver of adverse health impacts from industrial sources of air pollution across much of the country." *Id*. at 8).

2. The Revised Plan continues to include two monitors, the Valley and Northwest Monitors, which are not sited in areas of expected peak SO_2 concentrations and therefore are not suited for NAAQS compliance monitoring.

3. In light of the requirement in the Data Requirements Rule that the monitors begin collecting data by January 1, 2017, we urge DNR to finalize and EPA to approve the Revised Plan expeditiously. We understand that DNR, EPA, and Ameren have already agreed to the two new monitor locations. While we support the location of the two new monitors based on currently-available information, we object that the public was excluded from the discussions regarding new monitor locations and that this public comment period comes far too late in the process for public input to be taken seriously.

4. The Revised Plan makes no changes regarding the monitors around Ameren's Rush Island plant even though two of the monitors are not in peak concentration areas.

I. A Monitor Is Necessary Southeast of Labadie To Address Expected Peak SO_2 Concentrations In That Area.

Ameren's recent modeling evaluation, which utilizes on-site meteorological data from the Valley monitoring site, strongly supports the need for an SO_2 monitor southeast of Labadie. According to EPA's SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document ("Monitoring TAD"), "the most valuable data for this application [monitoring site evaluations] are meteorological data collected very nearby or even on the property of an identified SO_2 emitting facility ... These on-site data typically have very good spatial representativeness of the area in which the identified SO_2 source is situated, and thus, provide the best information to understand the actual conditions in which SO_2 emissions are being dispersed."[4] Therefore, Ameren's recent modeling evaluation is more representative of conditions around Labadie than previous evaluations by both DNR and Ameren, which used airport data from the National Weather Service ("NWS") instead of on-site data.

The results of Ameren's recent modeling are shown in Figures 1-4. These figures show normalized design values ("NDVs") for all receptors exceeding 75 percent of the maximum NDV and score ranks for the top 200 receptors for all meteorological and emissions datasets used in the modeling.[5]

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[4] EPA, SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document (Feb. 2016, Draft) ("Monitoring TAD") at 6, available at https://www.epa.gov/sites/production/files/2016-06/documents/so2monitoringtad.pdf.

[5] Because the Valley monitoring site was flooded from the end of December 2015 until late March 2016 resulting in a gap in the on-site meteorological data, Ameren used four separate meteorological datasets in its modeling: 1) Valley site data from April 22, 2015 through June 30, 2016; 2) Valley site data from April 22, 2015 through June 30, 2016 with the gap filled with NWS data from Jefferson City Memorial Airport; 3) Valley site data from April 22, 2015 through June 30, 2016 with the gap filled with NWS data from Spirit of St. Louis Airport; and 4) Weather Research and Forecasting model data for the year 2015. Ameren also used three separate emissions datasets: 1) actual hourly emissions (normalized) with actual hourly stack temperatures and exit velocities; 2) a fixed emission rate with constant stack temperature and exit velocity based on all units operating at >500 MW ("high-load scenario"); and 3) a fixed emission rate with constant stack temperature and exit velocity based on all units operating between 300-450 MW ("mid-load scenario").

We calculated receptor score ranks, which provide a means of prioritizing receptor locations for consideration as permanent monitoring sites using NDVs and frequency of having the highest 1-hour daily maximum concentration, using the methodology described in Appendix A of the Monitoring TAD.

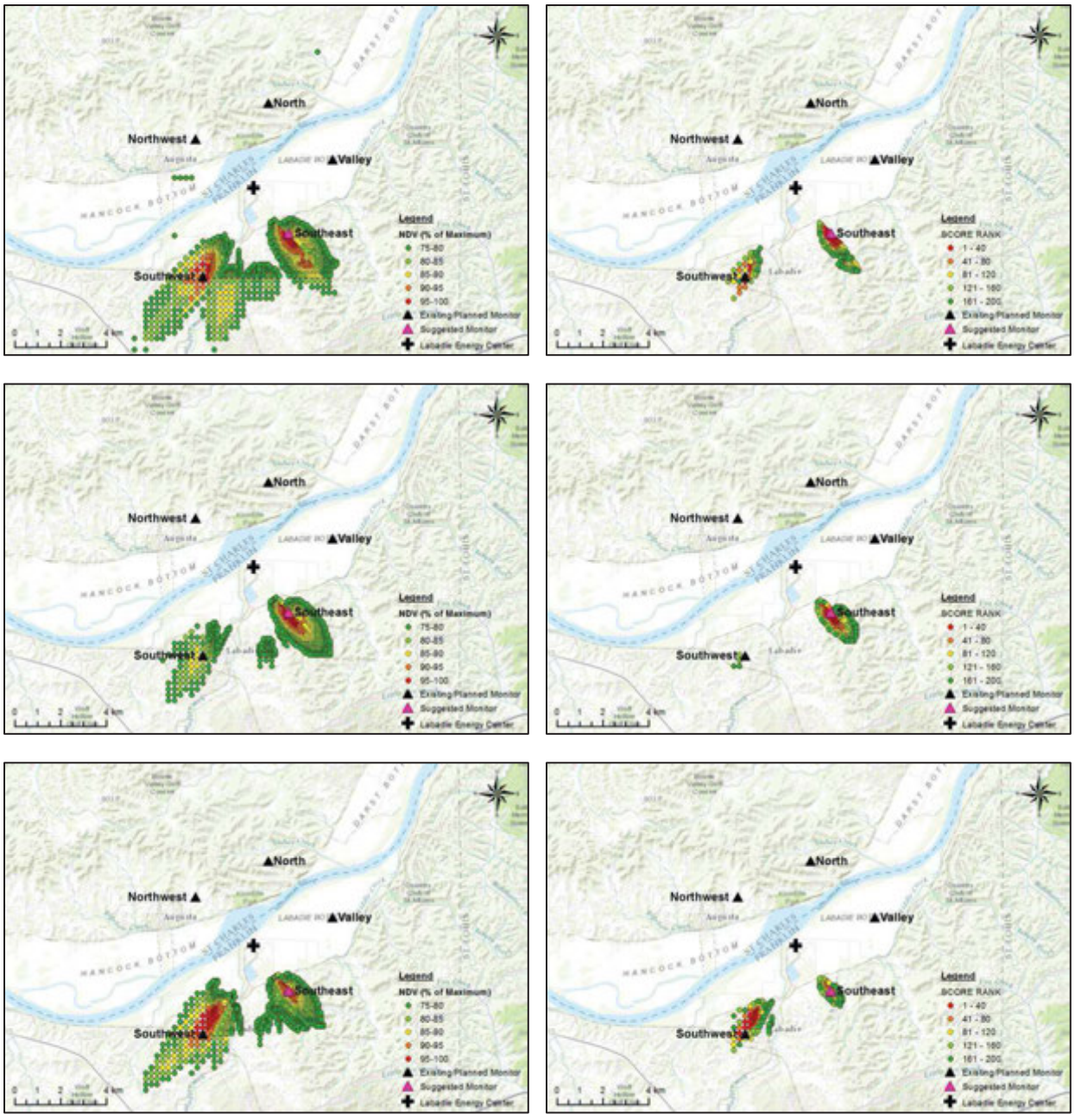

Figure 1: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using meteorological data from the Valley site. The top, middle, and bottom rows show results for the actual hourly emissions scenario, the high-load scenario, and the mid-load scenario, respectively.

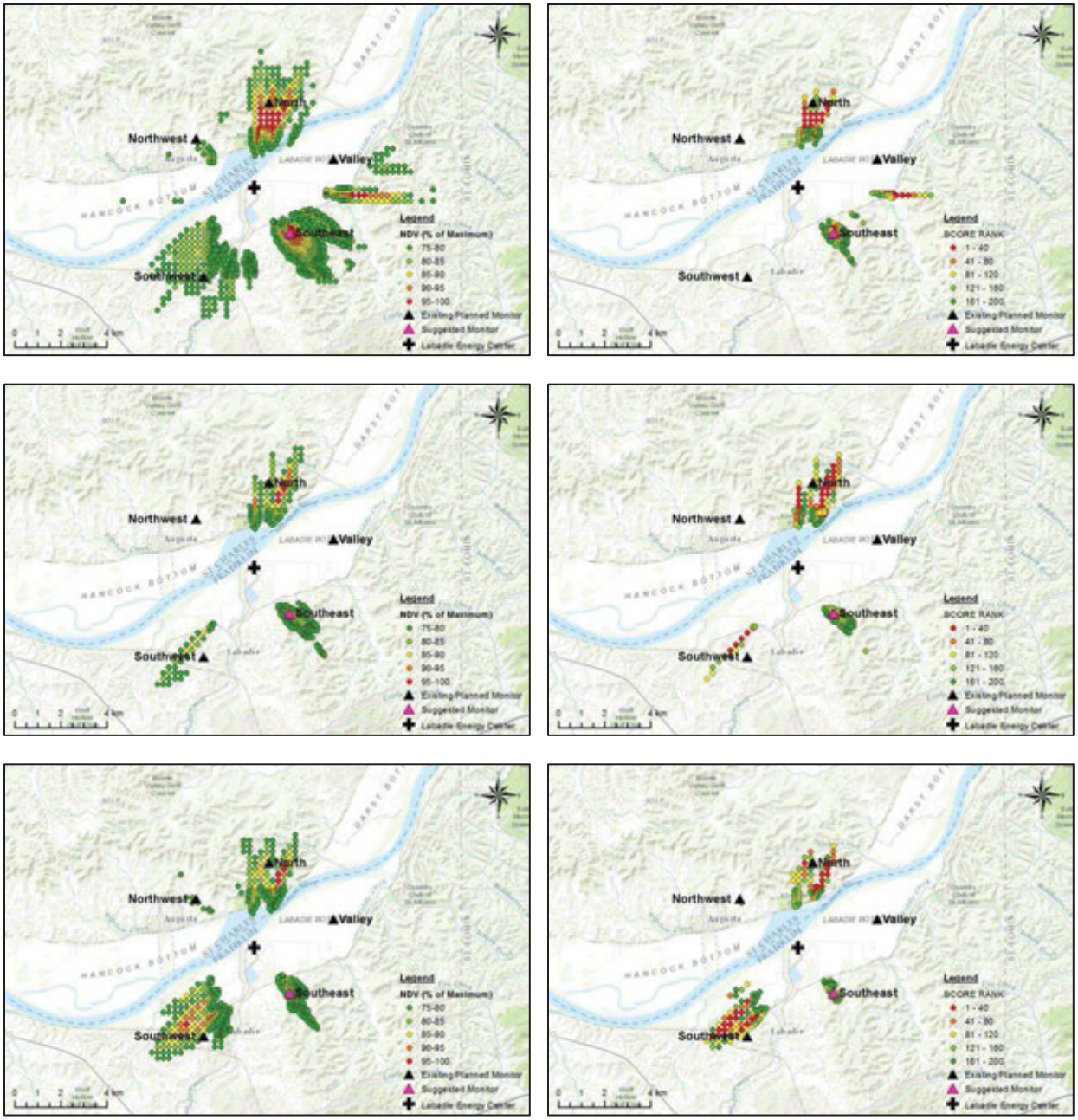

Figure 2: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using meteorological data from the Valley site with the gap in on-site data filled with NWS data from Jefferson City Memorial Airport. The top, middle, and bottom rows show results for the actual hourly emissions scenario, the high-load scenario, and the mid-load scenario, respectively.

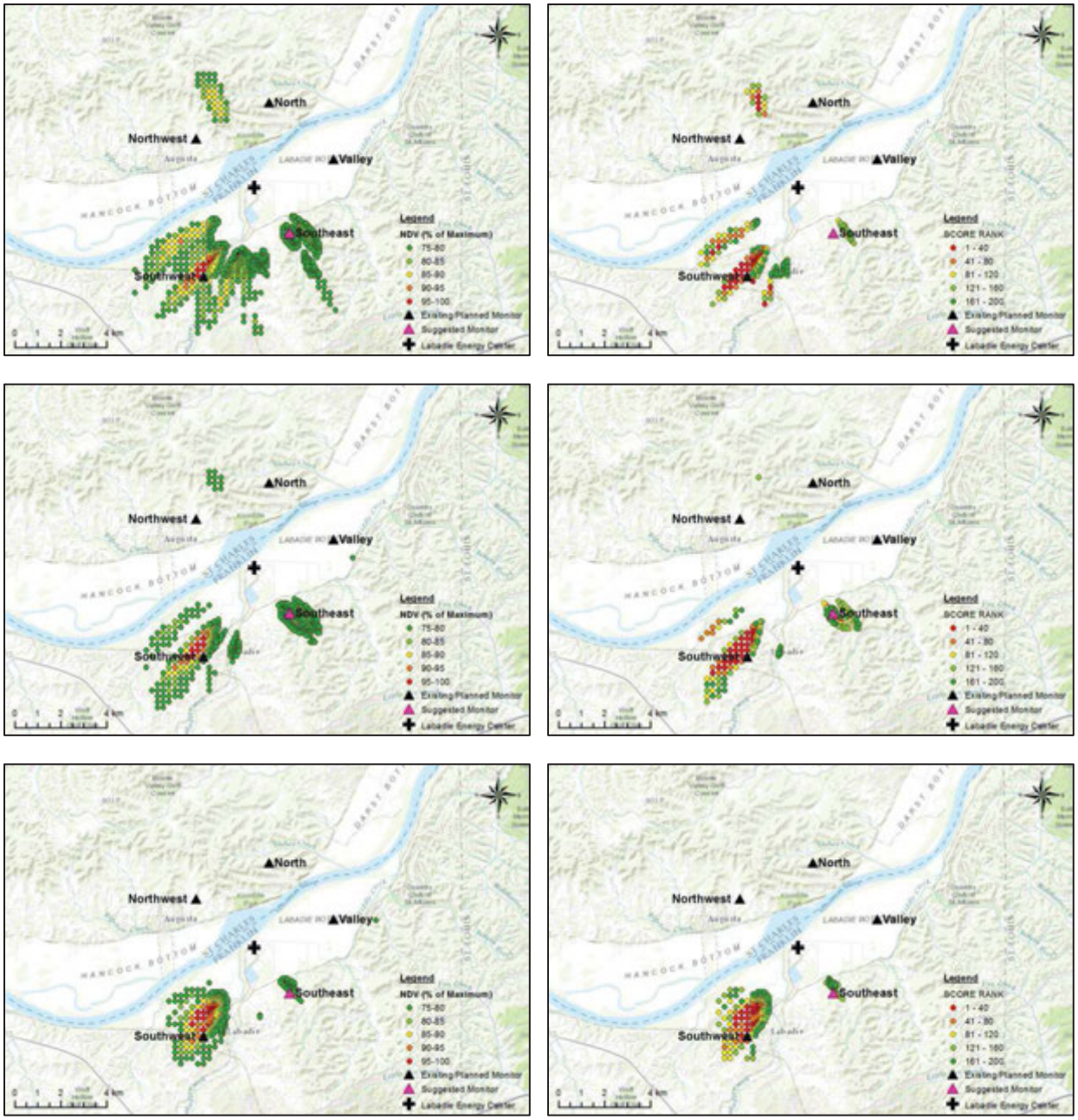

Figure 3: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using meteorological data from the Valley site with the gap in on-site data filled with NWS data from Spirit of St. Louis Airport. The top, middle, and bottom rows show results for the actual hourly emissions scenario, the high-load scenario, and the mid-load scenario, respectively.

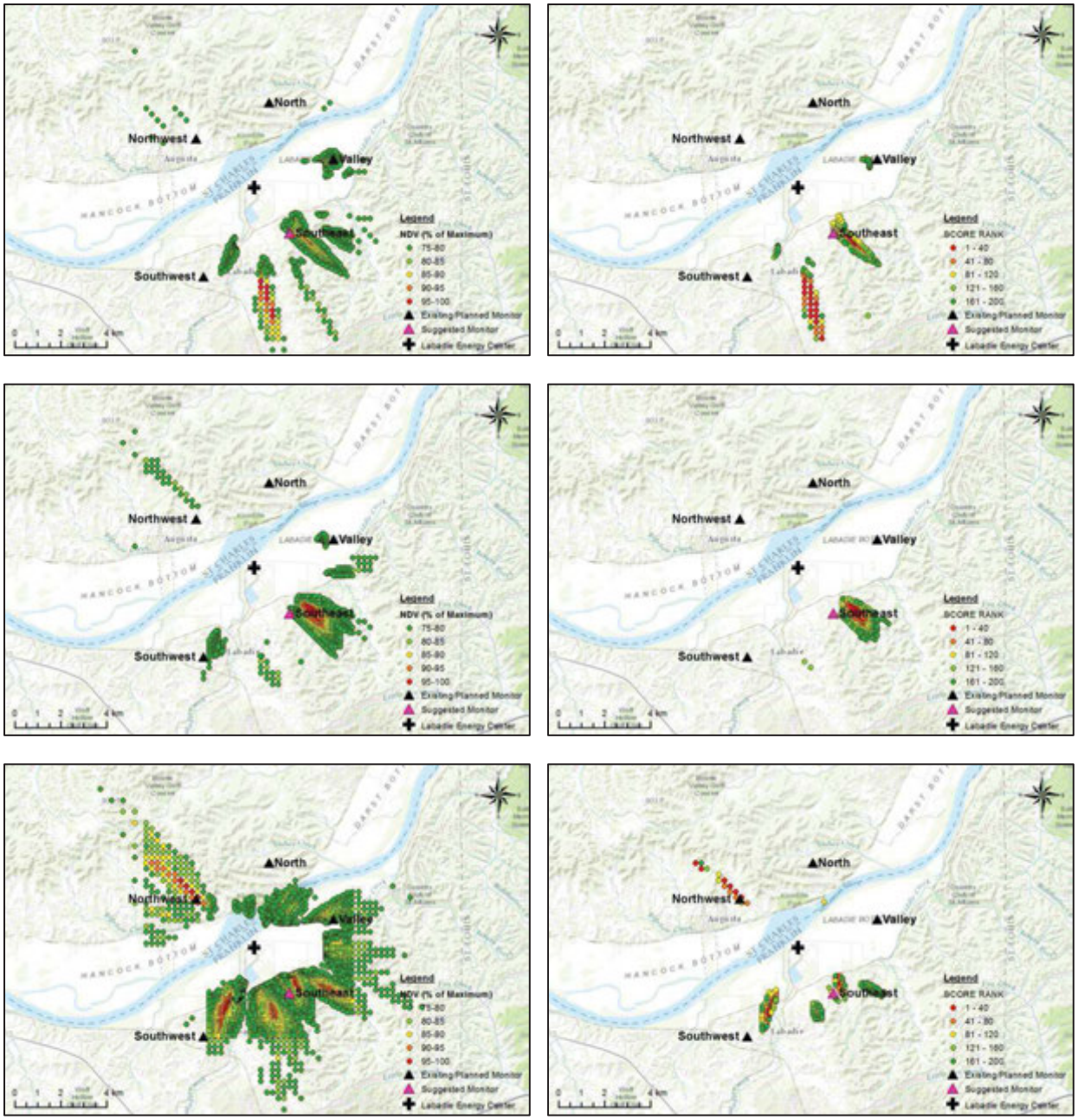

Figure 4: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using Weather Research and Forecasting model meteorological data. The top, middle, and bottom rows show results for the actual hourly emissions scenario, the high-load scenario, and the mid-load scenario, respectively.

As Figures 1-4 clearly demonstrate, all of Ameren's recent modeling shows an area of high NDVs and/or highly ranked receptors southeast of Labadie. The size and exact locus of the area, modeled NDVs, and receptor ranks all vary somewhat depending on the meteorological and emissions datasets used. However, in every instance there is a grouping of top 200 receptors in the area that frequently includes some of the most highly ranked receptors. Further, modeled NDVs in the area are always greater than 75 percent of the maximum NDV and are greater than 90 or 95 percent of the maximum in over half of the runs. Hence the modeling strongly supports a monitor southeast of the plant.

In addition, Appendix 5 of the Revised Plan, "Review of Proposed Additional Southwest and North SO_2 Monitoring Stations Around the Labadie Energy Center," includes an analysis by Ameren that purports to combine the results of all modeling runs using the four different meteorological datasets (for the actual hourly and high-load emissions scenarios) in order to determine a preferred monitor location.[6] The results of Ameren's analysis are shown in Figures 5 and 6.[7]

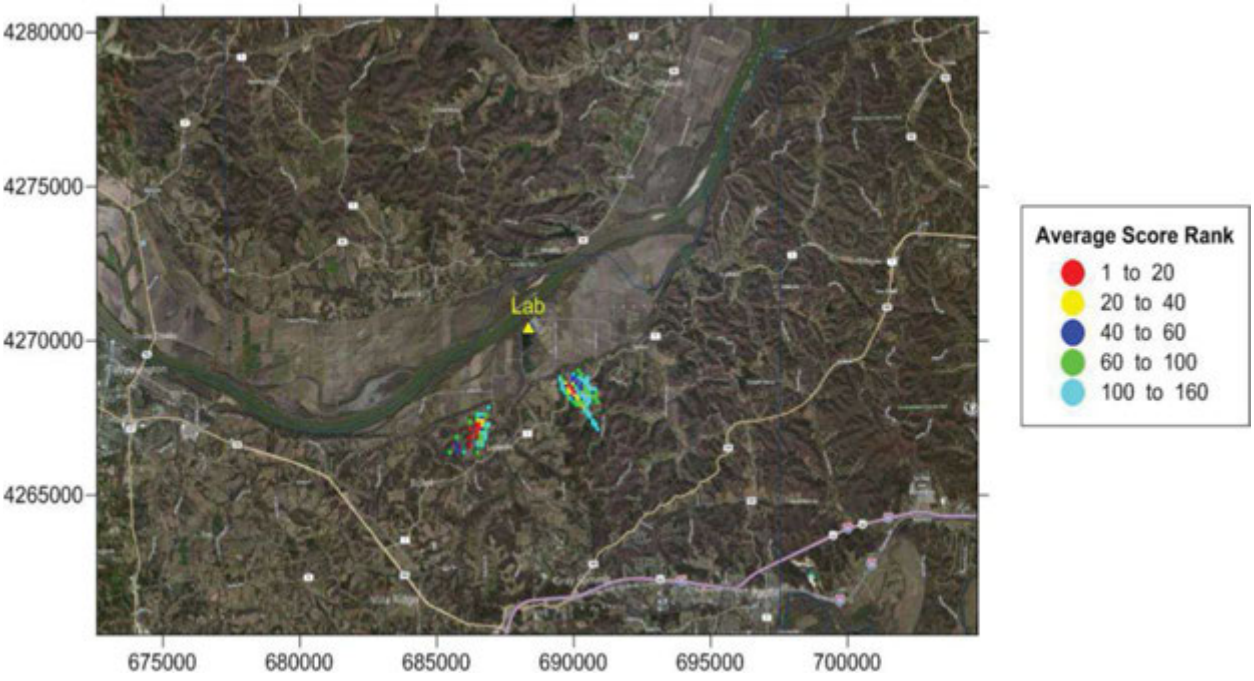

Figure 5. Summary average score rank over all met scenarios, actual hourly emissions scenario.

[6] Revised Plan at 172. ("To further refine a preferred monitor location from the scenario predictions, the top 200 NDV receptors for these two operating conditions were combined into individual files of 800 receptors (top 200 NDV receptors for each meteorological scenario). These receptors were then searched to see if any of the top 200 NDV receptors for each meteorological scenario were repeated. A list of receptors that occurred in at least two or more of the meteorological scenarios were compiled and the average score rank for those duplicate receptors was calculated. Those duplicate receptors were then ranked. This ranked list of receptors represents a consensus between the four different meteorological scenarios as to the best location to site an additional SO_2 monitor.")

[7] Figures 5 and 6 reproduce Figures 6 and 7, respectively, from Revised Plan, Revision 1, Appendix 5.

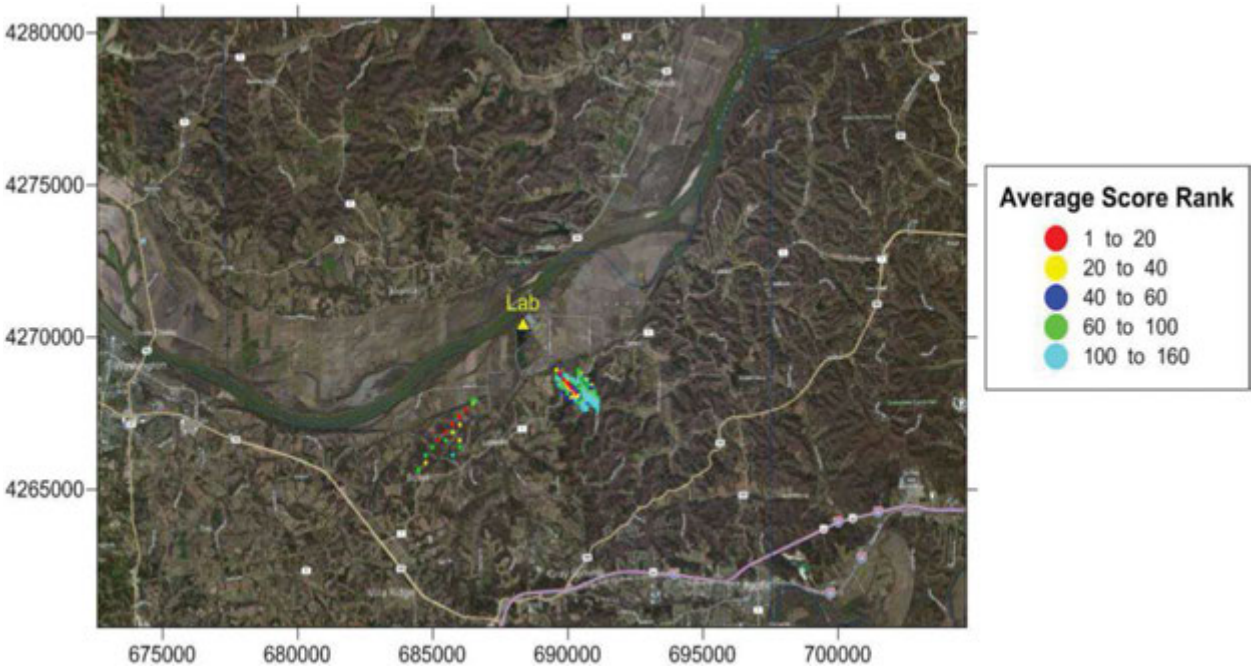

Figure 6. Summary average score rank over all met scenarios, high-load emissions scenario.

Figures 5 and 6 both show groupings of duplicate receptors with high average score ranks southeast and southwest of Labadie. This analysis provided Ameren's justification for the new Southwest monitor. However, it also clearly demonstrates the need for a monitor southeast of the plant, an area Ameren itself labeled a "preferred monitoring location" pursuant to its own analysis.[8] The addition of a southeast monitor is critical to monitoring all significant areas around Labadie where peak 1-hour SO_2 concentrations are expected to occur. Our suggested location, shown in Figures 1-4, was chosen due to the high modeled concentrations in the area, the lack of obstructions and easy access to utilities, and because it is out of the floodplain in elevated terrain with better exposure to Labadie's emissions.

II. The Valley and Northwest Monitors Are Not Sited In Areas of Peak SO_2 Concentrations And Therefore Should Not Be Used for NAAQS Compliance Monitoring.

The Valley and Northwest monitors are not sited in areas of peak SO_2 concentrations. As EPA previously concluded based on an analysis of wind rose information and historic monitoring locations, "… neither of the current monitoring site locations are placed in areas representative of maximum concentrations … The current monitors are not in the predominant wind directions, nor are they located at elevated terrain surrounding Labadie, like the historic monitors were."[9] Ameren's recent modeling evaluation, which is more representative than previous evaluations,

[8] Revised Plan at 176. ("As can be seen from the figures, only locations to the southwest and southeast of the Labadie Energy Center remain as preferred SO_2 monitoring locations.")
[9] Response to Comments at 82.

supports EPA's conclusion that the current monitors are not sited in areas of peak SO_2 concentrations. Figures 1-4 above show that the Valley and Northwest monitors are neither in areas with the highest NDVs nor in areas where the receptors with the highest score ranks (calculated per the scoring strategy in the Monitoring TAD) are located.

The Revised Plan states that the Sierra Club previously supported the location of the Northwest monitor.[10] That conclusion is outdated because it was based on an earlier modeling evaluation that used NWS airport data instead of on-site meteorological data. However, on-site meteorological data is now available and EPA's Monitoring TAD indicates that on-site data is typically "the most valuable data for this application."[11] Modeling using the best currently available data, including on-site meteorological data, demonstrates that the Northwest site is not an appropriate location as it is not in an area of expected peak SO_2 concentrations.

III. DNR Has Not Allowed For Meaningful Public Input.

There has been considerable and widespread public concern about the Labadie plant's air pollution and its health impacts for some time. Labadie is the 14th largest coal-burning power plant in the United States, the largest source of SO_2 emissions in Missouri, and the largest plant in the country without any SO_2 controls.

Reflecting these concerns, both St. Charles County and the City of Pacific (in Franklin County) adopted resolutions calling upon EPA "to ensure that a sufficient number of sulfur dioxide monitors are placed around the Labadie coal plant and that they are placed in locations where the highest levels of pollution are expected to be detected."[12]

Sierra Club has repeatedly questioned the adequacy of the Labadie monitors since they were first proposed by Ameren in its "Labadie Sulfur Reduction Project Quality Assurance Project Plan."[13] After EPA weighed in with similar concerns in connection with its June 30, 2016 designation decision[14] and it became clear that EPA, DNR, and Ameren were discussing possible additional monitoring locations, Sierra Club repeatedly requested that the public be included in those discussions. However, the discussions proceeded behind closed doors, and DNR and EPA have already approved the two new locations. Both agencies had approved the location of the Southwest monitor by late September,[15] just as DNR had approved Ameren's siting of the Northwest and

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[10] Revised Plan, Comments and Responses On Proposed 2016 Monitoring Network Plan, Revision 0.
[11] Monitoring TAD at 6.
[12] St. Charles County Resolution No. 16-08 (Sept. 12, 2016); City of Pacific Resolution No. 2016-34 (Sept. 20, 2016).
[13] Letter from Clinic on behalf of Sierra Club to DNR (Patricia Maliro) with copies to EPA re Comments on Ameren Missouri's Labadie Sulfur Reduction Quality Assurance Project Plan (Apr. 13, 2015); Letter from Clinic on behalf of Sierra Club to DNR (Stephen Hall) with copies to EPA re 2015 Monitoring Network Plan (July 20, 2015); Letter from Clinic on behalf of Sierra Club to DNR (Stephen Hall) with copies to EPA re Supplemental Comments on 2015 Monitoring Network Plan (Aug. 11, 2015); Letter from Clinic on behalf of Sierra Club to DNR with copies to EPA re 2016 Monitoring Network Plan dated May 27, 2016 (June 28, 2016).
[14] Response to Comments at 79-87.
[15] E-mail chain between DNR (Kyra Moore) and EPA (Michael Jay) and within EPA (Michael Jay and Leland Grooms), with final email addressed to Ameren from DNR with copies to EPA (Sept. 23, 2016) (Exhibit 1).

Valley monitors before publication of the 2015 Monitoring Network Plan. In light of what is effectively agency pre-approval of the Revised Plan, and the fact that all monitors to be used for SO_2 NAAQs compliance monitoring must be operational by January 1, 2017, the current comment period does not serve as a bona fide request for public input on a decision with significant public health implications. While we support prompt EPA approval of the Revised Plan and expect the new Southwest and North monitors to be operating by no later than January 1, we note that the process by which these monitors were sited excluded the public and did not provide a timely opportunity for Sierra Club to advance its position that an additional monitor Southeast of the plant should be included in the Labadie monitoring network.

IV. The Rush Island Monitors Are Not Properly Sited.

The Revised Plan makes no changes regarding the monitors around Ameren's Rush Island plant. On behalf of the Sierra Club, we hereby reiterate and incorporate by reference our previous critique of those monitor locations.[16]

V. Conclusion

Ameren's Labadie and Rush Island power plants are the two largest sources of sulfur dioxide emissions in Missouri. While virtually all other plants of their size across the nation have already adopted or made binding commitments to adopt scrubber technology to dramatically reduce their sulfur dioxide emissions, Ameren instead has installed monitors that are not in expected peak SO_2 concentrations around these two plants. The Northwest and Valley monitors at Labadie and the Natchez and Weaver-AA monitors at Rush Island are not located in areas of peak SO_2 concentrations. Their inclusion in the Monitoring Network Plan is inconsistent with the regulatory requirements for SO_2 NAAQS compliance monitoring.

Sierra Club supports the addition of the Southwest and North monitors at Labadie, and urges EPA to approve the Revised Plan expeditiously to ensure that the monitors are fully operational by the January 1, 2017 deadline of the Data Requirements Rule. Sierra Club also supports the addition of another monitor to the Southeast, to ensure that all significant areas of peak concentration around this very large source of SO_2 pollution are monitored.

Sincerely yours,

Maxine I. Lipeles, Director
Kenneth Miller, P.G., Environmental Scientist

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[16] Clinic letter to DNR (Patricia Maliro) with copies to EPA re Comments on Ameren Missouri's Analysis of SO_2 and Meteorological Monitoring Stations Around Its Rush Island Energy Center (May 29, 2015) (Exhibit 2); Letter from Clinic on behalf of Sierra Club to DNR (Stephen Hall) with copies to EPA re 2015 Monitoring Network Plan (July 20, 2015) (Exhibit 3); Letter from Clinic on behalf of Sierra Club to DNR with copies to EPA re 2016 Monitoring Network Plan dated May 27, 2016 (June 28, 2016) (Exhibit 4).

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Attorneys for the Sierra Club

Cc: Rebecca Weber, Director, Air & Waste Management Division, EPA Region 7
Michael Jay, Chief, Air Planning & Development Branch, EPA Region 7
Kyra Moore, Director, Air Pollution Control Program, DNR
Darcy Bybee, Chief, Air Quality Planning Section, Air Pollution Control Program, DNR

From: Moore, Kyra0J
Sent: Friday, September 23, 2J 16 2:36 PM0J
To: 'Whitworth, Steve C'0J
Cc: ay, Michael; Bybee, Darcy0J
Subject: Ameren Labadie SW Monitoring Location0J
Attachments: Possible SW Loc.pdf0J

Steve,T
Although EPA and MDNR staff are still writing up theTreport of the monitoring site visit this week, thisT email confirms that the Southwest location (N 38.528T4, WT-90.86326T) is appropriate for the use of aT Data Requirements Rule Monitor and meets federal monitoring siting criteria. Please proceed withT finalizing the details of this location.T

As we discussed MDNR will add this site to our Monitoring Network Plan. As discussions regardingT monitoring north of the plant are still ongoing, we will wait to re-public notice the plan until all monitoringT decisionsTaround the Labadie area are final.T

If you have any questions, please let me know.T
hanks!T
KyraT

Kyra L. Moore, DirectorT
MDNR Air Pollution Control Program
1659 E. Elm StreetT
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(573) 75T-7840T
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Promoting, Protecting and Enjoying our Natural Resour es. Learn more t dnr.mo.gov.

Fro : Jay, Michael [mailtoeJay.Michael@epa.gov]e
Sent: Friday, September 23, 2016 1e23 PMe
To: Moore, Kyrae Grooms, Lelande
Cc: Davis, Michaele Hall, Stephene
Sub ect: RE:eResults from site visit?e

Kyra,J

We can confirm that this map displaying the proposed site location is in the maximum modeled impactJ area to the southwest of the facility.J

Mike JayJ

Branch ChiefJ
Air Planning and Development BranchJ
USEPA R7J
913-551-746J

Fro : Grooms, Leland [mailtoGrooms.Leland@epa.gov]e
Sent: Friday, September 23, 2016 10e23 AMe
To: Jay,eMichaele
Cc: Davis, Michaele Moore, Kyrae Hall, Stephene
Sub ect: Re Results from site visit?e

Hey MikeJ

I am putting together a summary of the site visits from 9J21-9J22 that should be ready byJ Monday.J However, I can say with full confidence that the SWJlocation is a good site and fullyJ meets all CFR criteria.J

Leland

Leland Grooms, EPA Region 7J
Monitoring & Environmental Sampling Branch (MESB)J
Senior Environmental ScientistJ
Leader, Air Monitoring TeamJ
913 551-5J 1J cp: 913 549-2266J

From: ay, MichaelJ
Sent: Friday, September 23, 2J 16 9:37:J AMJ
To: Grooms, Leland
Cc: Davis, Michael; Kyra Moore; Hall, StephenJ
Subject: Results from site visit?J

Lee,J

The Air program would like to tentatively agree to the SW site if you are good with it?J With this emailJ Ameren would be willing to finalize lease agreement and install monitor in order to meet our JanJ deadline under DRR.J Kyra can u send map of this location?J

Mike JayJ

Branch ChiefJ
Air Planning and Development BranchJ
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913-551-746J

Washington University in St. Louis
SCHOOL OF LAW
Interdisciplinary Environmental Clinic

May 29, 2015

Ms. Patricia Maliro
Chief, Air Quality Monitoring Unit
Air Pollution Control Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176
Via email to patricia.maliro@dnr.mo.gov

Re: Comments on Ameren Missouri's Analysis of SO_2 and Meteorological Monitoring Stations Around Its Rush Island Energy Center

Dear Ms. Maliro:

On behalf of the Sierra Club, we submit the following comments on the report by Ameren Missouri titled Analysis of SO_2 and Meteorological Monitoring Stations Around Ameren Missouri's Rush Island Energy Center (Ameren's Monitoring Stations Analysis), which it submitted to DNR on or about April 29, 2015. The report describes the methodology Ameren used to determine the locations of three proposed ambient SO_2 monitoring stations and one meteorological monitoring station around its Rush Island Energy Center in Jefferson County, Missouri. Pursuant to a March 23, 2015 Consent Agreement with DNR, Ameren is required to install and begin operation of an SO_2 monitoring network around the Rush Island plant on or before December 31, 2015.

We believe Ameren's proposed monitoring sites should be rejected because they are located outside areas where peak 1-hour SO_2 concentrations are expected to occur based on the modeling described in Ameren's report. Furthermore, the modeling described in the report does not comport with EPA guidance on characterizing ambient air quality in areas around or impacted by significant SO_2 emission sources such as the Rush Island Energy Center and therefore may have failed to correctly identify areas of expected ambient, ground-level SO_2 concentration maxima. We also have concerns regarding the appropriateness of the meteorological data used in the modeling.

I. Based on the Modeling Described in Ameren's Report, the Proposed Monitoring Sites are Located Outside Areas Where Peak 1-Hour SO_2 Concentrations are Expected to Occur

The Consent Agreement (Appendix 1, ¶b) requires that "the number and location of SO_2 monitors and meteorological station(s) shall ensure that the approved SO_2 monitoring network represents ambient air quality in areas of maximum SO_2 impact from the Rush Island Energy Center." Ameren's Monitoring Stations Analysis (p. 3) describes the modeling it performed to

"delineate areas where maximum concentrations are expected to occur for this type of source and thus where SO_2 monitoring systems should be placed."

Unfortunately, the monitoring sites proposed by Ameren are not, in fact, located in "areas of maximum SO_2 impact from the Rush Island Energy Center," as required by the Consent Agreement.

Figures 1 through 4 below show the results of Ameren's modeling, which we derived using model input files provided by DNR. Figure 1 shows modeled SO_2 design values in the vicinity of the plant; Figure 2 shows receptors with modeled design values greater than or equal to 75 percent of the maximum modeled design value (146.1 ug/m^3); Figure 3 shows the number of times the model-derived maximum daily 1-hour concentration exceeded 75 percent of the maximum modeled design value at each receptor; and Figure 4 shows the receptors with the top 200, 100, 25, and 10 modeled design values. The locations of the plant and the proposed Fults, Natchez, and Weaver-AA SO_2 monitoring stations and the proposed Tall Tower meteorological monitoring station are shown on all figures for reference.

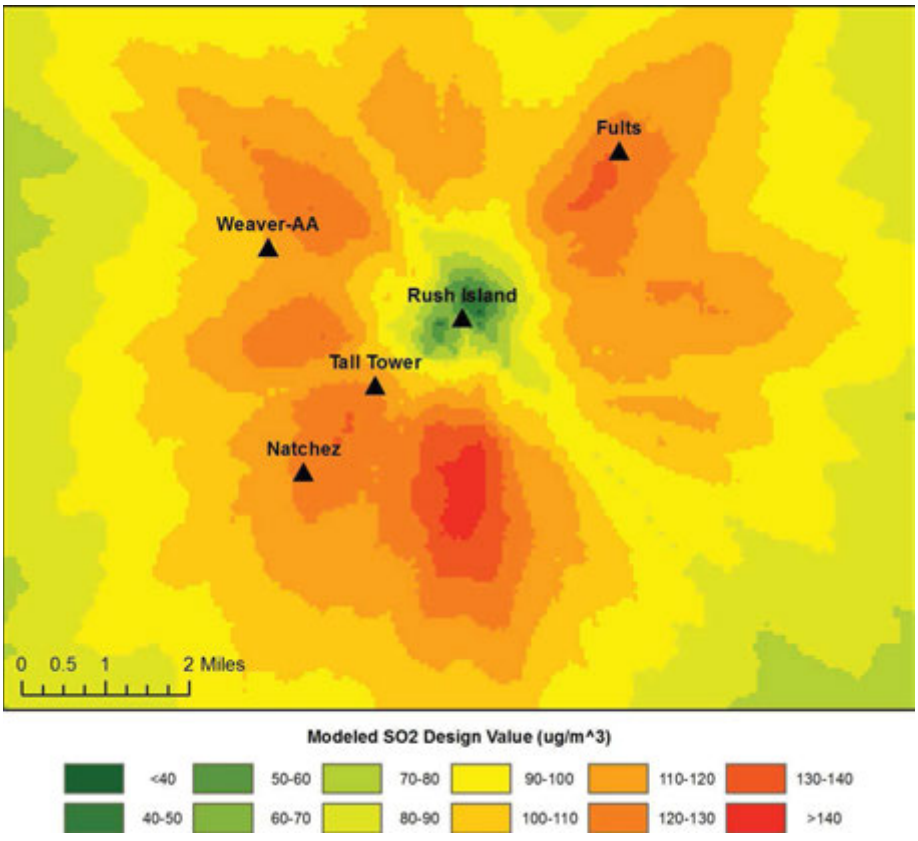

Figure 1. Modeled SO_2 design values in the vicinity of the Rush Island Energy Center.

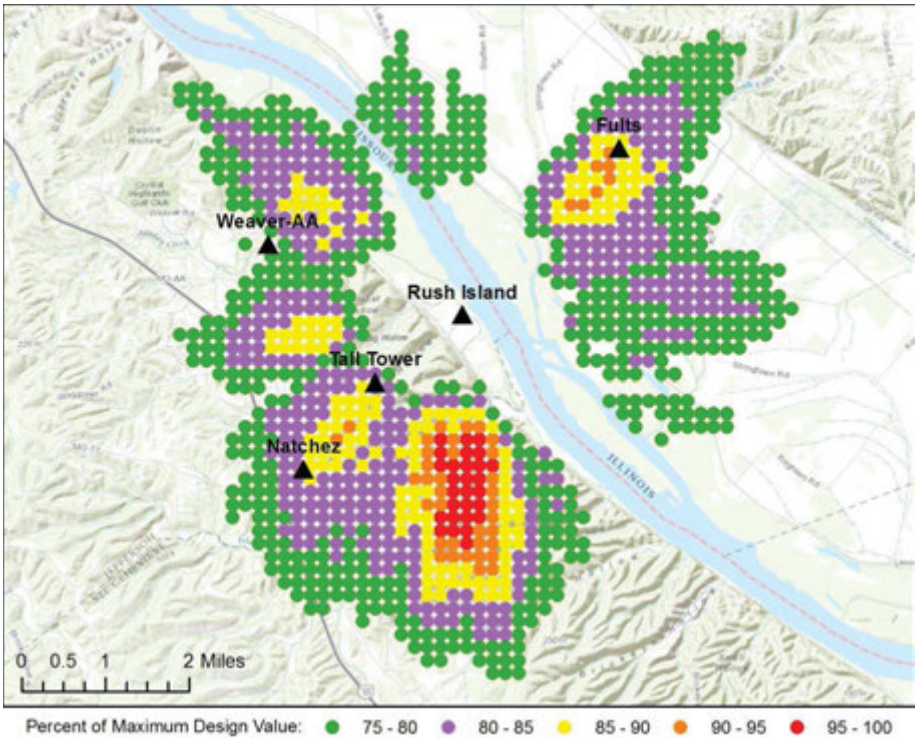

Figure 2. Receptors with modeled design values ≥75 percent of the maximum modeled design value.

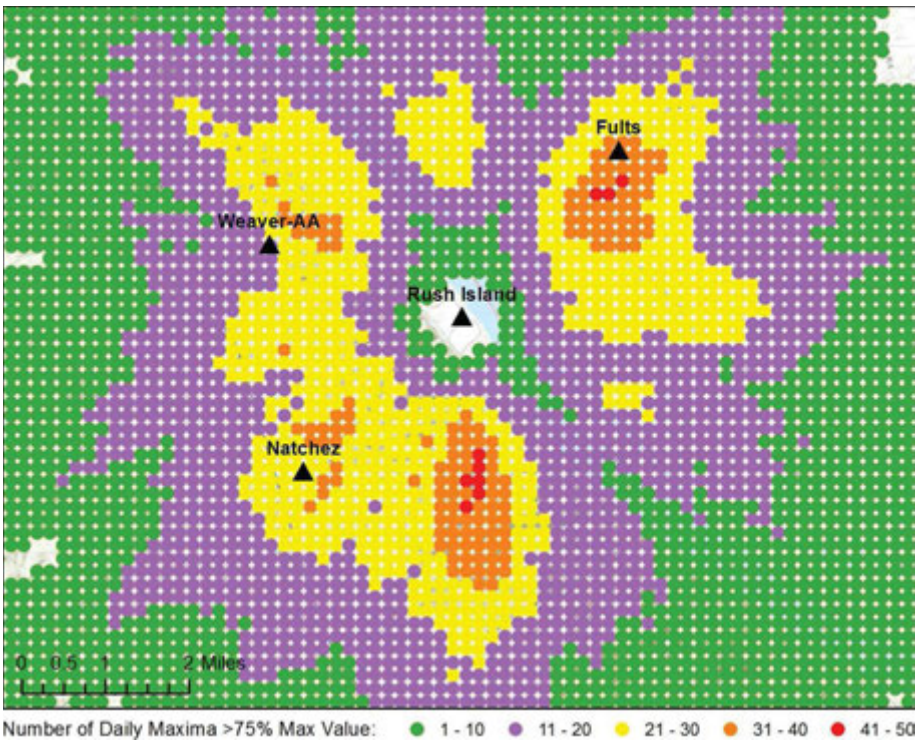

Figure 3. Number of maximum daily 1-hour concentrations ≥75 percent of the maximum modeled design value.

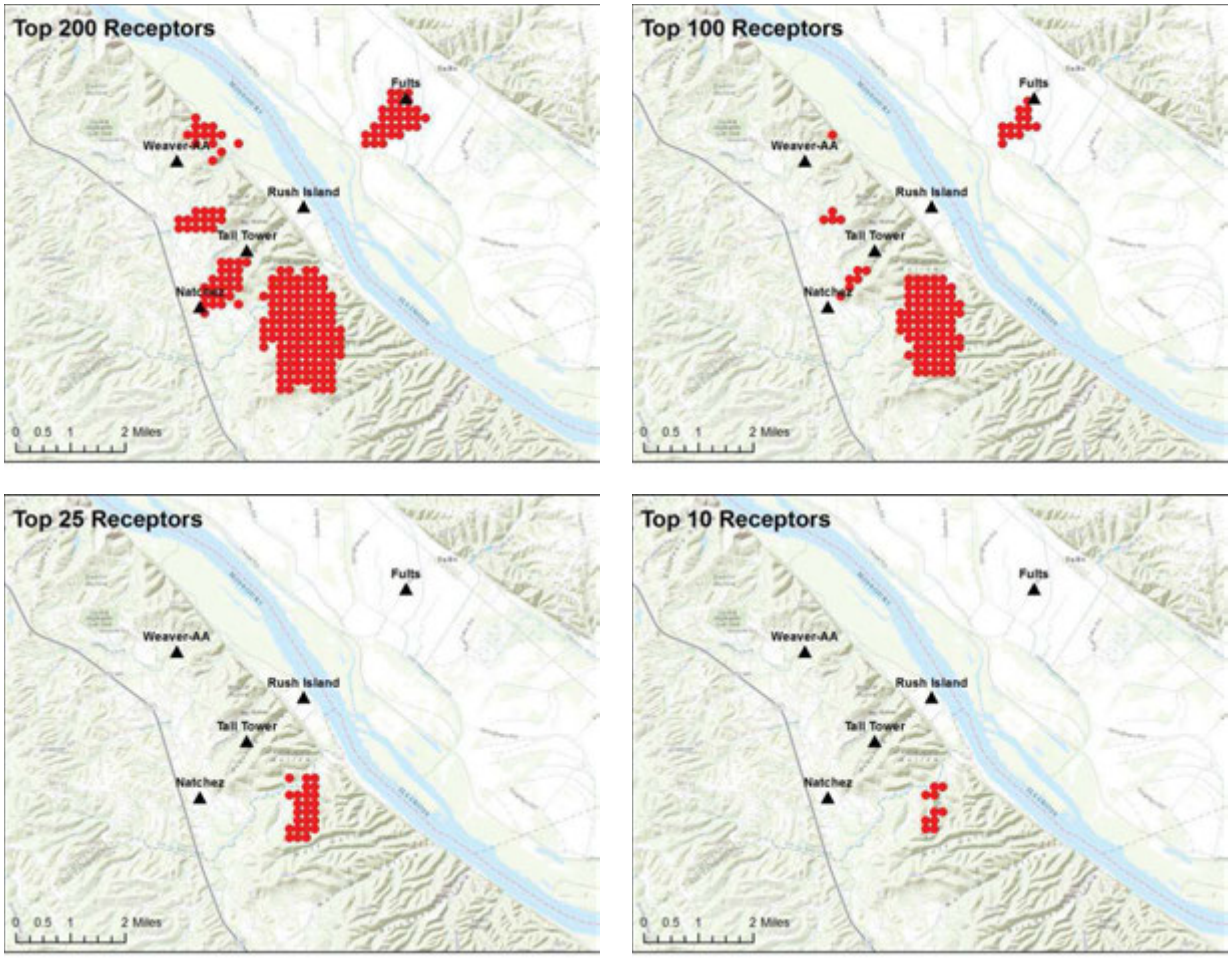

Figure 4. Receptors with the top 200, 100, 25, and 10 modeled design values.

Figures 1 through 4 all reveal a strikingly similar pattern regarding the areas where peak 1-hour SO_2 concentrations are expected to occur around the Rush Island Energy Center. There is a large area due south of the plant where modeled design values are the highest (in excess of 95 percent of the maximum modeled design value), where modeled maximum daily 1-hour concentrations frequently exceeded 75 percent of the maximum modeled design value, and where over half of the top 200 receptors (including all of the top 25 and three quarters of the top 100) are located. There are also four other areas where modeled design values are slightly lower but still very high (in excess of 85 percent of the maximum modeled design value), where modeled maximum daily 1-hour concentrations frequently exceeded 75 percent of the maximum modeled design value, and where the rest of the top 200 receptors are located. These four areas, located northeast, northwest, west, and southwest of the plant, plus the area south of the plant where modeled design values are the highest, are where Ameren's modeling predicts peak 1-hour SO_2 concentrations are expected to occur. Monitoring stations located in these areas would have the greatest chance of identifying peak SO_2 concentrations in ambient air, which is the primary objective of source-oriented monitoring and an absolute necessity when monitoring to assess

compliance with the NAAQS. However, none of Ameren's proposed monitoring stations is located in any of these areas of highest expected concentrations.

The most glaring omission is that there is no proposed monitoring station in the large area of highest expected concentrations south of the plant. This omission renders the proposed monitoring network inadequate for its intended purpose of assessing compliance with the NAAQS because a) NAAQS violations are most likely to occur in this area, and b) violations could occur in this area even when concentrations are below the NAAQS in other high concentration areas, given that the modeling predicts lower SO_2 concentrations in those areas. Ameren's Monitoring Stations Analysis claims that this area is "not accessible" because it hosts an industrial plant (Holcim). The Analysis does not indicate whether Ameren sought Holcim's permission to site a monitor on the Holcim property, and does not delineate the Holcim property boundary in terms of the modeling results. In other words, it does not document the claim that this large area of maximum expected concentrations is inaccessible for monitoring. Nor does it evaluate the nearest non-Holcim site that might be available.

While we understand that the Consent Agreement between DNR and Ameren calls for monitoring, it requires that such monitoring "represents ambient air quality in areas of maximum SO_2 impact from the Rush Island Energy Center." If no monitoring site is in fact accessible in this large area of the very highest expected concentrations, then the proposed monitoring network will not fulfill Ameren's obligation under the Consent Agreement. Instead, DNR should employ modeling, which provides 360-degree coverage and can predict concentrations at otherwise-inaccessible locations, to ensure that SO_2 emissions from the Rush Island plant do not cause or contribute to NAAQS exceedances either inside or outside of the Jefferson County nonattainment area.

Furthermore, two of the proposed monitoring stations – Fults and Natchez – are located near but outside of areas of modeled peak concentration/high frequency instead of near the center of such areas, where concentrations are expected to be higher. The third proposed station – Weaver-AA – is located entirely outside of modeled peak concentration/high frequency areas. Figure 5 shows the locations of the proposed monitoring stations on a hybrid basemap comprised of Figures 1 (modeled design values) and 2 (receptors with modeled design values ≥75 percent of the maximum design value). Receptors that are among the 200 with the highest modeled design values are outlined for reference. All three monitoring stations could easily be sited in areas where higher 1-hour SO_2 concentrations are expected to occur with greater frequency, thereby increasing their chances of detecting any NAAQS exceedances that might occur around the Rush Island Energy Center. As discussed below, we urge DNR to consider these proposed optimized locations in lieu of Ameren's proposed Fults, Natchez, and Weaver-AA locations.

Fults – Of the three proposed monitoring stations, the Fults monitoring station is closest to an area where peak 1-hour SO_2 concentrations are expected to occur. However, moving the monitor less than one kilometer southwest of its current location would move it from an area with modeled design values in the 120-130 ug/m^3 range to an area with modeled design values in the 130-140 ug/m^3 range and place it near the center of a small group of receptors with modeled design values equal to 90-95 percent of the maximum modeled design value (the receptors

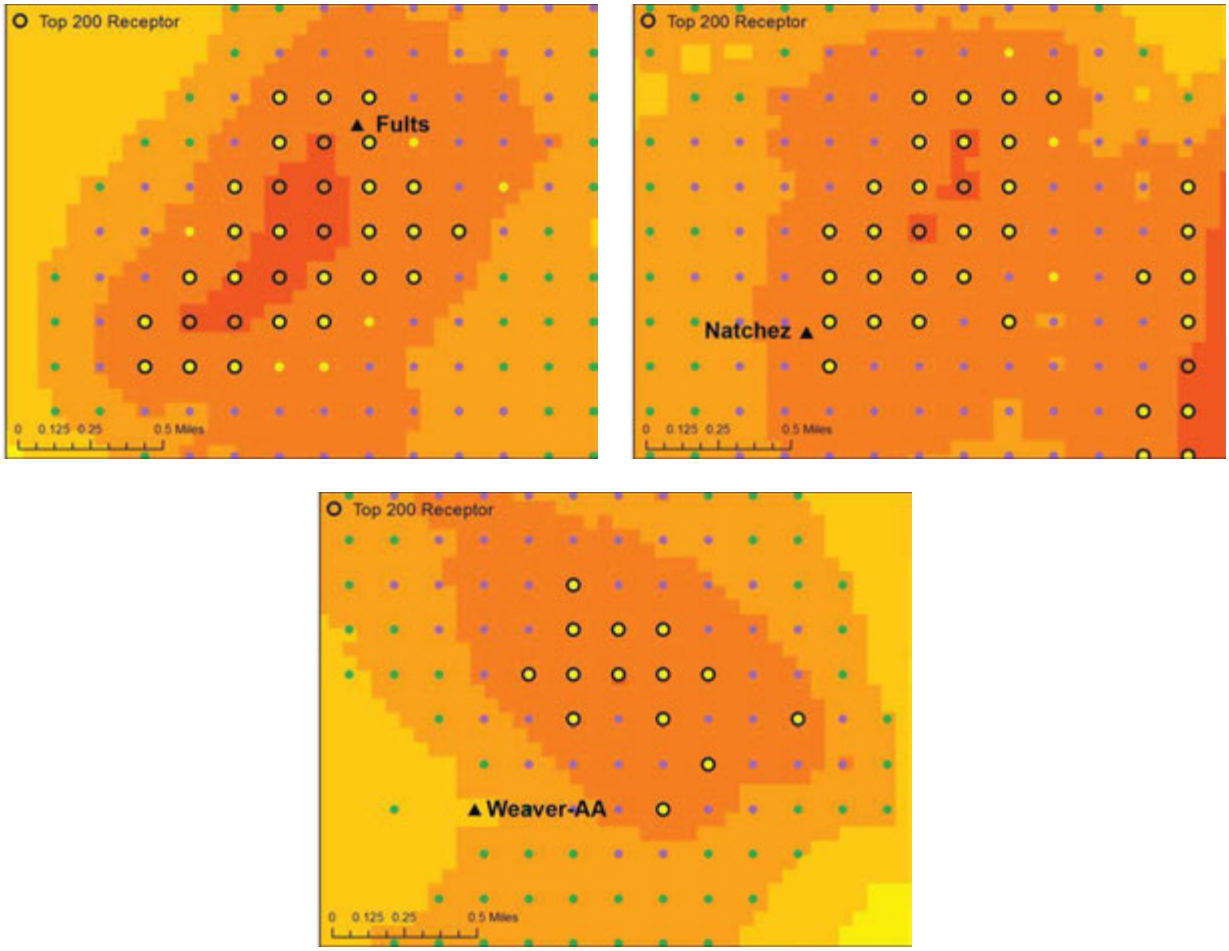

Figure 5. Modeled design values, receptors with design values ≥75 percent of the maximum modeled design value, and proposed monitoring station locations.

surrounding its current location generally have modeled design values equal to 85-90 percent of the maximum modeled design value). The entire area is floodplain/agricultural and Ivy Road, oriented northeast-southwest, runs through the middle of it, making the proposed optimized location as accessible as Ameren's proposed location and equally easy to provide power to.

Natchez – The Natchez monitoring station is outside/on the outer edge of an area where peak 1-hour SO_2 concentrations are expected to occur. Moving it approximately one kilometer northeast of its current location would move it from an area with modeled design values in the 120-130 ug/m^3 range to an area with modeled design values in the 130-140 ug/m^3 range, and place it between a pair of receptors with modeled design values equal to 90-95 percent of the maximum modeled design value (the receptors surrounding its current location have modeled design values equal to 80-90 percent of the maximum modeled design value). It would also move it to an area where higher concentrations are expected to occur with slightly greater frequency. The proposed optimized location is accessible via transmission right of way, and power is available along Dubois Creek Road to the south-southwest.

Weaver-AA – The Weaver-AA station is located completely outside of all areas where peak 1-hour SO2 concentrations are expected to occur. Modeled design values at its location are only in the 100-110 ug/m^3 range, and it is surrounded by receptors with modeled design values equal to just over 75 percent of the maximum modeled design value. Moving the monitor just over one kilometer east-northeast of its current location would place it in an area where modeled design values are 15-20 ug/m^3 higher, in the midst of a slightly dispersed group of receptors with modeled design values equal to 85-90 percent of the maximum modeled design value. At this optimized location, concentrations in excess of 75 percent of the maximum modeled design value are expected to occur roughly twice as often as at Ameren's proposed Weaver-AA location. The proposed optimized location is readily accessible via State Highway AA, and power is available along the highway.

Figure 6 compares the locations of Ameren's proposed Fults, Natchez, and Weaver-AA monitoring stations with optimized locations more likely to record maximum SO_2 concentrations in the area.

II. The Modeling Described in the Report Does Not Comport With EPA's Source-Oriented SO_2 Monitoring Guidance and Therefore May Not Correctly Identify Areas of Expected Ambient, Ground-Level SO_2 Concentration Maxima

EPA's SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document (TAD) provides guidance on how to "appropriately and sufficiently monitor ambient air in areas proximate to or impacted by an SO_2 emissions source to create ambient monitoring data for comparison to the SO_2 NAAQS" and presents "recommended steps to aid in identifying source-oriented SO_2 monitor sites."[1] The modeling performed to determine the locations of the proposed ambient SO_2 monitoring stations around the Rush Island Energy Center fails to adhere to the TAD in two important respects: 1) it does not use hourly emission rates, which are readily available for Rush Island's boilers from EPA's online Air Markets Program Data tool; and 2) it does not include nearby sources that may contribute significantly to ambient SO_2 concentrations in the vicinity of the plant and therefore should be included in the modeling.

EPA suggests using hourly emissions when available in order to represent the variability of actual emissions as accurately as possible,[2] which is important given the short-term nature of the SO_2 NAAQS. However, instead of using readily-available hourly emissions as recommended by EPA's monitoring TAD, Ameren's modeling uses constant emission rates for Rush Island's boilers. The consequence of using constant rather than hourly emission rates is that the effects of the interaction between hourly emissions and hourly variations in meteorological parameters are not captured by the model, so that the predicted areas of peak concentration are primarily a function of the meteorology used. For example, if peak hourly emissions coincide with times when strong winds blow from a direction other than the prevailing wind direction, a model that uses hourly emission rates might predict peak concentrations in different areas than the same

[1] U.S. EPA, SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, Dec. 2013 Draft, at 2, available at http://epa.gov/airquality/sulfurdioxide/pdfs/SO2MonitoringTAD.pdf.
[2] *Id*. at 11, referencing U.S. EPA, SO_2 NAAQS Designations Modeling Technical Assistance Document, Dec. 2013 Draft, at 10, available at http://epa.gov/airquality/sulfurdioxide/pdfs/SO2ModelingTAD.pdf.

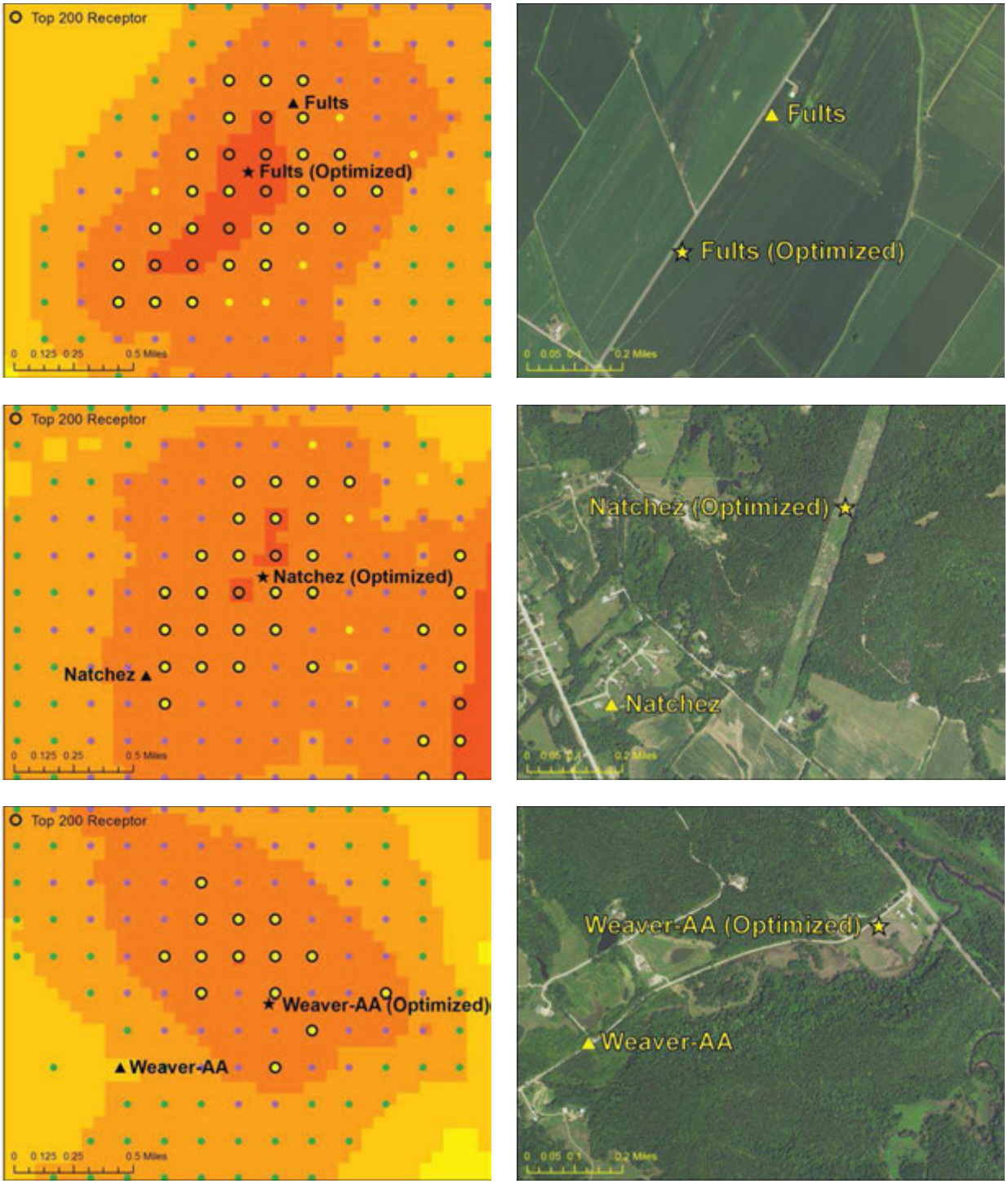

Figure 6. Current and optimized locations of the Fults, Natchez, and Weaver-AA monitoring stations

model would predict using constant emission rates. Therefore, using hourly emissions allows the areas where peak 1-hour SO_2 concentrations are expected to occur to be determined with greater confidence.

Regarding which sources to model, EPA suggests identifying and including all sources that may contribute significantly to ambient SO_2 concentrations – and thus to NAAQS exceedances – around the source of interest. The monitoring TAD notes that it is important to "understand the setting and surroundings of the SO_2 source" including determining "if the source is isolated or in an area with multiple SO_2 sources," and it affirms that the primary objective of monitoring is "to identify peak SO_2 concentrations in the ambient air that are attributable to an identified source *or group of sources*."[3] The Rush Island Energy Center is located in an SO_2 nonattainment area with numerous sources of varying magnitude. There are also a number of larger sources that are nearby but just outside of the nonattainment area, including River Cement, St. Gobain Containers, Holcim, Mississippi Lime, Dynegy's Baldwin Energy Complex, and Ameren's Meramec Energy Center. These sources may contribute significantly to ambient SO_2 concentrations in the vicinity of the Rush Island plant and should be included in the modeling unless it can be demonstrated that they do not have a significant influence on areas where peak 1-hour SO_2 concentrations are expected to occur.

III. The Meteorological Data Used in the Modeling May Not be Appropriate

Ameren's modeling uses National Weather Service (NWS) meteorological data from the Cahokia, Illinois airport located approximately 50 kilometers north of the plant. This is different from the meteorological data DNR used in its attainment demonstration modeling for the Jefferson County SO_2 nonattainment SIP. In its SIP modeling, DNR used onsite meteorological data from the now-closed Doe Run primary lead smelter in Herculaneum, approximately 18 kilometers northwest of the Rush Island plant. The Rush Island Energy Center is in the Jefferson County SO_2 nonattainment area, and the Jefferson County SIP states that the onsite meteorological data from Herculaneum is "considered more representative of the entire [nonattainment] area compared to a more distant NWS site."[4] Therefore, the Cahokia meteorological data used in Ameren's modeling may not be appropriate, particularly if – as suggested above – other nearby SO_2 sources are included in the modeling, given that DNR determined – based on the distribution of these sources – that the onsite Herculaneum meteorological data is more representative of the area that encompasses them.

Conclusion

Based on the modeling described in Ameren's report, the proposed locations of the Fults, Natchez, and Weaver-AA monitoring stations are not in modeled peak concentration/high frequency areas. Furthermore, Ameren has not proposed a monitoring station in the highest concentration area due south of the Rush Island Energy Center, citing the claimed but not

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[3] *Id*. at 2, 4 (emphasis added).

[4] DNR, Nonattainment Plan for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard, Jefferson County Sulfur Dioxide Nonattainment Area, May 28, 2015, at 26.

documented inaccessibility of potential monitoring sites in that area. The absence of a monitor in this large area of expected maximum concentration calls into question whether the proposed SO_2 monitoring network is an appropriate means of assessing compliance with the NAAQS in the area around the plant.

Ameren's proposed monitoring network does not fulfill its requirement under the Consent Agreement to install a monitoring network designed to record maximum expected SO_2 concentrations in the vicinity of the Rush Island plant. Nor is it designed to achieve Ameren's purported goal of obtaining "a good quality data set with representative SO_2 measurements and meteorological information"[5] or DNR's stated goal "to true-up modeling results further away from the Mott Street monitor … to confirm our assessment that the nonattainment area is in compliance with the 1-hour SO2 standard farther away from the violating monitor."[6]

We urge DNR to reject the proposed monitoring sites and require Ameren to add a monitoring station in the highest concentration area due south of the plant as well as to relocate the proposed Fults, Natchez, and Weaver-AA monitoring stations to the optimized locations shown in Figure 5. We also urge DNR to require Ameren to 1) rerun the air dispersion model described in the report using Rush Island's actual hourly emissions; 2) evaluate the effects of nearby interactive sources (including, at a minimum, River Cement, St. Gobain Containers, Holcim, Mississippi Lime, Dynegy's Baldwin Energy Complex, and Ameren's Meramec Energy Center) on modeled peak concentration/high frequency areas; and 3) evaluate the appropriateness of using meteorological data from the Cahokia, Illinois airport instead of Doe Run Herculaneum given DNR's determination that the latter is more representative of the modeled area.[7] We further urge DNR to require any necessary adjustments to the proposed monitoring network based on the results of these analyses.

Respectfully submitted,

Maxine I. Lipeles, J.D.
Ken Miller, P.G.
Interdisciplinary Environmental Clinic
Washington University School of Law

On behalf of the Sierra Club

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[5] DNR, Comments and Responses on Proposed Revision to Missouri State Implementation Plan – Nonattainment Plan for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard – Jefferson County Sulfur Dioxide Nonattainment Area, Comment #21, p. 10, available at http://dnr.mo.gov/env/apcp/docs/comments-and-responses-jeffco.pdf.

[6] *Id*., Response to Comment #4, p. 3.

[7] This analysis should consider and make use of the corrected Herculaneum meteorological data set processed in AERMET with the Bulk Richardson Number option invoked.

Cc: Rebecca Weber, Director, Air & Waste Management Division, EPA Region 7
Josh Tapp, Chief, Air Planning & Development Branch, EPA Region 7
Kyra Moore, Director, Air Pollution Control Program, DNR
Wendy Vit, Chief, Air Quality Planning Section, Air Pollution Control Program, DNR

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July 20, 2015

Mr. Stephen Hall
Chief, Air Quality Analysis Section
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102
Via email to: cleanair@dnr.mo.gov

Re: 2015 Monitoring Network Plan

Dear Mr. Hall:

On behalf of the Sierra Club, we urge the Missouri Department of Natural Resources ("DNR") to revise the proposed 2015 Monitoring Network Plan[1] in order to satisfy the requirements of the Clean Air Act. In particular, DNR should refrain from proposing new sulfur dioxide ("SO_2") monitoring sites near Ameren's Labadie power plant until EPA completes an area designation for the plant. Monitors near Labadie should be sited based on the modeling that is used to determine the nonattainment area boundary, which will identify areas of expected peak ambient SO_2 concentrations around the plant based on current EPA guidance. Should DNR persist in proposing new SO_2 monitoring sites near the Labadie plant in the 2015 Monitoring Network Plan, then based on currently-available modeling, one of the two proposed new monitoring sites near the plant is not located in an area where peak SO_2 concentrations are expected to occur and should be relocated. A third monitoring site should also be added southeast of the plant. Similarly, based on currently-available modeling, two of the three proposed new monitoring sites near Ameren's Rush Island plant are not located in areas where peak SO_2 concentrations are expected to occur and should be relocated.[2] These changes are necessary to ensure that the Labadie and Rush Island monitors capture maximum ambient SO_2 concentrations near these large sources.

This letter highlights the following key points:

- It is premature to site and install new SO_2 monitors at the Labadie plant until EPA completes an area designation for the plant.
- While DNR plans to use the proposed new Labadie and Rush Island monitors as State and Local Air Monitoring Stations ("SLAMS"),[3] it is not submitting them for EPA approval as required for SLAMS.

[1] MO DEP'T OF NATURAL RES. AIR POLLUTION CONTROL PROGRAM, 2015 MONITORING NETWORK PLAN, June 12, 2015 ("2015 Monitoring Network Plan").
[2] The three proposed new SO_2 monitoring sites that should be relocated, as discussed more fully below, are the Valley site near Ameren's Labadie plant and the Natchez and Weaver-AA sites near Ameren's Rush Island plant.
[3] 2015 Monitoring Network Plan at 12.

- Based on currently-available modeling, one of the two proposed new Labadie monitoring sites and two of the three proposed new Rush Island monitoring sites are unlikely to capture maximum ambient SO_2 concentrations because they are not located in areas where peak SO_2 concentrations are expected to occur.
- DNR has not adequately justified the locations of the proposed new Labadie and Rush Island monitoring sites. The support offered for the monitoring site locations in DNR's plan was provided by Ameren (Appendices 2 and 4). DNR visually observed the proposed sites at both plants but only performed independent modeling - which does not entirely support Ameren's proposed locations - regarding the Rush Island sites (Appendix 5). DNR did not perform independent modeling regarding the Labadie sites.

I. DNR Should Refrain From Proposing New SO_2 Monitoring Sites Near Ameren's Labadie Plant Until EPA Completes An Area Designation For The Plant.

It is premature to determine SO_2 monitoring site locations near the Labadie plant. DNR is about to propose a nonattainment area boundary recommendation for the Labadie plant,[4] and EPA must make a final area designation for the plant by July 2016.[5] While the Ameren modeling used to site the Labadie monitors in the 2015 Monitoring Network Plan was performed in a manner inconsistent with current EPA guidance, the modeling used to determine the nonattainment area boundary will identify areas of peak ambient SO_2 concentrations around the plant using current EPA guidance. It is likely that the Labadie monitors will ultimately be used to determine whether the nonattainment area comes into attainment, and they must be properly sited in order to provide reliable data.

The only modeling offered to support the proposed new Labadie monitoring sites was performed by Ameren in 2012.[6] Whereas DNR performed independent modeling to assess Ameren's proposed Rush Island monitoring sites (discussed in III.B. below), DNR did not perform independent modeling to assess Ameren's proposed Labadie monitoring sites. The 2015 Monitoring Network Plan states that DNR conducted "a review of relative dispersion modeling, local meteorological evaluation methodology submitted by Ameren UE, historical departmental SLAMS SO_2 monitoring data, nearby meteorological stations, and local topography."[7] However, only Ameren's modeling pointed to the proposed monitor locations. The other information either pointed to different locations or supported no particular monitoring site location. For example, the historical analysis of the former Augusta and Augusta Quarry monitors concluded where *not* to place monitors,[8] but did not point to a location that would accurately represent the highest ambient SO_2 concentration near the Labadie plant.[9] In addition, the analysis of wind

[4] DNR has announced that it will propose a Labadie designation by July 27, 2015.
[5] Sierra Club v. Gina McCarthy, No. 3:13-cv-3953-SI (Consent Decree, March 2, 2015).
[6] 2015 Monitoring Network Plan, Appendix 3.
[7] 2015 Monitoring Network Plan at 14.
[8] The Augusta Quarry data analysis suggests that the plant was responsible for high concentrations near the quarry. *Id.* at 15-19. Without comparative conditions between current proposed monitor locations and the historical monitor locations, the historical data is irrelevant to locating the proper sites for new monitors.
[9] *Id.*

direction through the valley points to placing monitor(s) either to the northeast or southwest of the plant,[10] but it is too vague to support any specific monitoring site location.

The reliance upon Ameren's modeling would not be so concerning if Ameren had proposed monitors in locations with the highest modeled SO_2 concentrations around Labadie. However, one of Ameren's two proposed monitoring sites is outside any of the three areas where its modeling predicted peak SO_2 concentrations are expected to occur, leaving two of the three peak concentration areas completely unmonitored. In addition, Ameren's modeling does not comport with EPA guidance.

In sum, DNR should not propose any Labadie monitoring sites until EPA completes an area designation for the plant because 1) DNR will have to perform modeling that comports with EPA guidance as part of the Labadie designation process; 2) DNR intends to use the Labadie monitoring data in assessing whether the nonattainment area ultimately comes into attainment;[11] and 3) the Clean Air Act requires that monitors sited for National Ambient Air Quality Standard ("NAAQS") compliance purposes be incorporated into the state's monitoring network, subject to EPA review and approval.[12]

II. DNR Should Seek EPA Approval For The Proposed New Labadie And Rush Island SO_2 Monitors Because It Intends To Use Them As SLAMS.

The 2015 Monitoring Network Plan adds two new SO_2 monitors near Ameren's Labadie plant[13] and three new SO_2 monitors near Ameren's Rush Island plant.[14] The plan labels these as Special Purpose Monitors ("SPMs"), but states that "it is the intention to convert these monitors to SLAMS" once EPA finalizes the proposed Data Requirements Rule.[15]

Because DNR plans to use data from these new monitors to assess compliance with the 2010 1-hour SO_2 NAAQS, and because the Rush Island monitors are part of the Jefferson County Nonattainment State Implementation Plan ("SIP"), the siting of these monitors should be subject to EPA approval as required for SLAMS.[16] Indeed, it is unclear why the 2015 Monitoring Network Plan does not formally propose these new monitors as SLAMS.

Ameren proposed the Labadie monitoring sites to DNR and then constructed and began operating them just before the 2015 Monitoring Network Plan was published.[17] DNR approved the Labadie monitoring sites without conducting an independent modeling analysis to determine whether they are located in areas where peak SO_2 concentrations are expected to occur, without

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[10] *Id.* at 19-20.
[11] 2015 Monitoring Network Plan at 12.
[12] Clean Air Act § 110 (a)(2)(B), 42 U.S.C. § 7410(a)(2)(B); 40 CFR § 58.10.
[13] 2015 Monitoring Network Plan at 12-21.
[14] *Id*. at 22-23.
[15] EPA expects to publish the final Data Requirements Rule in October 2015. http://yosemite.epa.gov/opei/rulegate.nsf/byRIN/2060-AR19.
[16] 40 C.F.R. § 58.10(a)(2) and (e).
[17] DNR approved Ameren's proposed Labadie monitoring sites on May 1, 2015, and published the 2015 Monitoring Network Plan on June 12, 2015.

providing for public notice and comment, and without submitting the proposed monitor locations to EPA for its review and approval.

With respect to Rush Island, DNR submitted the Jefferson County Nonattainment SIP to EPA for review and approval on or about June 1. While it contained the requirement for Ameren to propose, build, and operate SO_2 monitoring sites at Rush Island, it did not identify the proposed Rush Island monitoring sites included in the 2015 Monitoring Network Plan published 11 days later on June 12, 2015.

Given DNR's stated intention to convert these monitors to SLAMS once EPA finalizes the proposed Data Requirements Rule – which it is expected to do in the next few months – the only salient difference between proposing them as SPMs rather than SLAMS in the 2015 Monitoring Network Plan is that EPA does not have to approve their locations. If DNR were to propose them as SLAMS in the 2015 Monitoring Network Plan or simply wait a few months and propose them as SLAMS after the final Data Requirements Rule is published, EPA *would* have to approve their locations. Proposing them as SPMs now when they will likely be converted to SLAMS in just a few months is suspect because, practically, it will be more difficult for EPA to object to the poor siting of the monitors and require that they be relocated after they are in operation.

The purpose of the NAAQS is to protect the public health.[18] Therefore, NAAQS compliance decisions must be based on properly-sited monitors designed to record maximum ambient SO_2 concentrations. Because one of the proposed new Labadie monitoring sites and two of the proposed new Rush Island monitoring sites are not located in areas of anticipated maximum ambient SO_2 concentrations (based on currently-available modeling), those monitors should be relocated – regardless of whether they are currently labeled SPMs or SLAMS. And EPA should notify DNR and Ameren that it will not accept data from those monitors for NAAQS compliance purposes unless they are appropriately relocated. Moreover, EPA should notify DNR and Ameren that it is premature to determine appropriate monitoring site locations for the Labadie plant until it completes an area designation for the plant.

III. Based On Currently-Available Modeling, Three Of The Five Proposed New Labadie And Rush Island Monitoring Sites Are Not Located In Areas Of Anticipated Maximum Ambient SO_2 Concentrations.

EPA regulations and guidance require ambient SO_2 monitors to be sited where peak concentrations are expected to occur.[19] With respect to source-oriented SO_2 monitoring, EPA guidance states:

> The primary objective is to place monitoring sites at the location or locations of expected peak concentrations.[20]

[18] Clean Air Act § 109(b)(1), 42 U.S.C. § 7409(b)(1).
[19] 40 C.F.R. Part 58, Appendix D, § 1.1.1(a), (c). See also U.S. EPA: OFFICE OF AIR AND RADIATION, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, AIR QUALITY ASSESSMENT DIVISION, SO_2 NAAQS DESIGNATIONS SOURCE-ORIENTED MONITORING TECHNICAL ASSISTANCE DOCUMENT, Dec. 2013 ("SO_2 Monitoring TAD").
[20] SO_2 Monitoring TAD at 16.

Further, the Consent Agreement between DNR and Ameren that is included in both the Jefferson County SIP and the 2015 Monitoring Network Plan requires that the monitoring at Rush Island "represents ambient air quality in areas of maximum SO_2 impact from the Rush Island Energy Center."[21]

However, one of the two proposed new Labadie monitoring sites and two of the three proposed new Rush Island monitoring sites are not located in the areas where peak SO_2 concentrations are expected to occur based on Ameren's and DNR's modeling.

On behalf of the Sierra Club, we previously critiqued Ameren's proposed Labadie and Rush Island monitoring site locations in letters submitted to DNR. Those letters are attached as Exhibits 1 and 2 and hereby incorporated by reference.

A. Based On Currently-Available Modeling, One Of The Two Proposed New Labadie Monitoring Sites Should Be Relocated, And A Third Monitor Should Be Added Southeast of the Plant.

In our April 13, 2015 comments to DNR on Ameren's proposed new Labadie monitoring sites, attached as Exhibit 1, we demonstrated that one of the proposed sites – the Valley site – is not located in any of the areas where Ameren's modeling predicts peak SO_2 concentrations are expected to occur. Ameren's modeling identified three distinct areas where the highest SO_2 concentrations are expected to occur and where high concentrations are expected to occur most frequently. These areas are located northwest, northeast, and southeast of the plant and are shown in Figure 1 below. However, only one of the two proposed Labadie monitoring sites – the Northwest site – is located in one of these peak concentration areas (the one located northwest of the plant). The Valley site is located between the other two peak concentration areas, in an area where the modeled concentration is only about 80 percent of the maximum concentration predicted by the model. As a result, it is unlikely to capture maximum ambient SO_2 concentrations and should be relocated to the peak concentration area northeast of the plant.

In addition, DNR should also require the installation of a third monitor in the peak concentration area southeast of the plant lest anticipated maximum ambient SO_2 concentrations in this area – which are likely to have implications for NAAQS compliance – go undetected by the Labadie SO_2 monitoring network.

B. Two Of The Three Proposed New Rush Island Monitors Should Also Be Relocated.

In our May 29, 2015 comments to DNR on Ameren's proposed new Rush Island monitoring sites, attached as Exhibit 2, we demonstrated that all three of the proposed sites, but especially the Natchez and Weaver-AA sites, are located outside areas where Ameren's modeling predicts peak SO_2 concentrations are expected to occur. DNR has since performed an independent modeling evaluation of the proposed sites which follows EPA guidance more closely and is

[21] 2015 Monitoring Network Plan, Appendix 3, 2015 Ameren Missouri and Missouri Department of Natural Resources Consent Agreement, Appendix A, ¶ b, at 13 of 15.

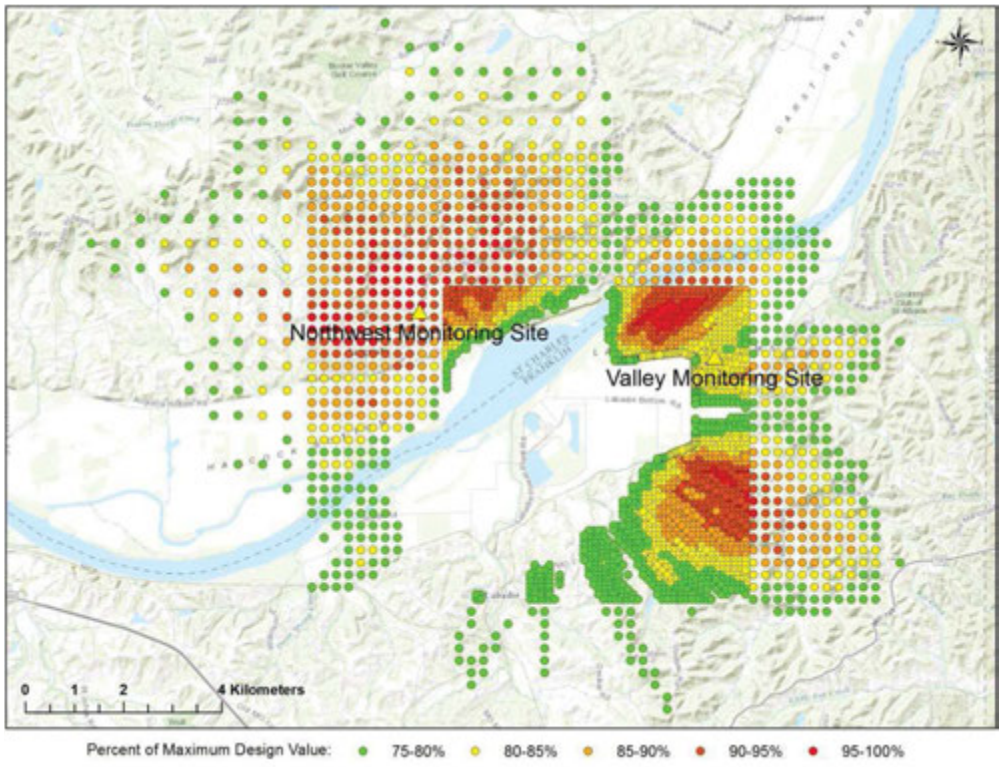

Figure 1. Modeled peak concentration areas near Ameren's Labadie plant.

therefore more reliable than Ameren's modeling. While DNR concluded that the proposed sites are properly located in areas where peak SO_2 concentrations are expected to occur, there is a significant flaw in DNR's analysis that, when corrected, confirms that the Natchez and Weaver-AA sites are located outside of peak concentration areas and should be relocated.

The stated purpose of DNR's evaluation of the proposed new Rush Island monitoring sites was to determine if the sites "will adequately represent Rush Island Energy Center's SO_2 air quality impact." DNR used hourly emission rates from EPA's Air Markets Program in its modeling as recommended in EPA's SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document whereas Ameren used constant emission rates.[22]

However, DNR's analysis of its modeling is based on a methodology that inherently biases the results. DNR used a telescoping receptor grid in its modeling; specifically, it used a 100-meter receptor spacing out to 1 kilometer, a 250-meter spacing out to 3.5 kilometers, a 500-meter spacing out to 10 kilometers, and a 1,000-meter spacing out to 50 kilometers. In order to identify areas where peak SO_2 concentrations are expected to occur, it plotted the predicted SO_2 design value at each receptor and drew polygons around high concentration areas by including all receptors with concentrations greater than 90 ug/m^3. This is shown in Figure 2 below. DNR then

[22] However, neither Ameren nor DNR included interactive sources as recommended by EPA guidance. See Exhibit 2 at 9.

counted the number of high concentration receptors (i.e., receptors with concentrations greater than 90 ug/m^3) in each polygon and ranked the polygons from highest to lowest in terms of the number of high concentration receptors they contained. The results of this analysis are summarized in Table 1 below.

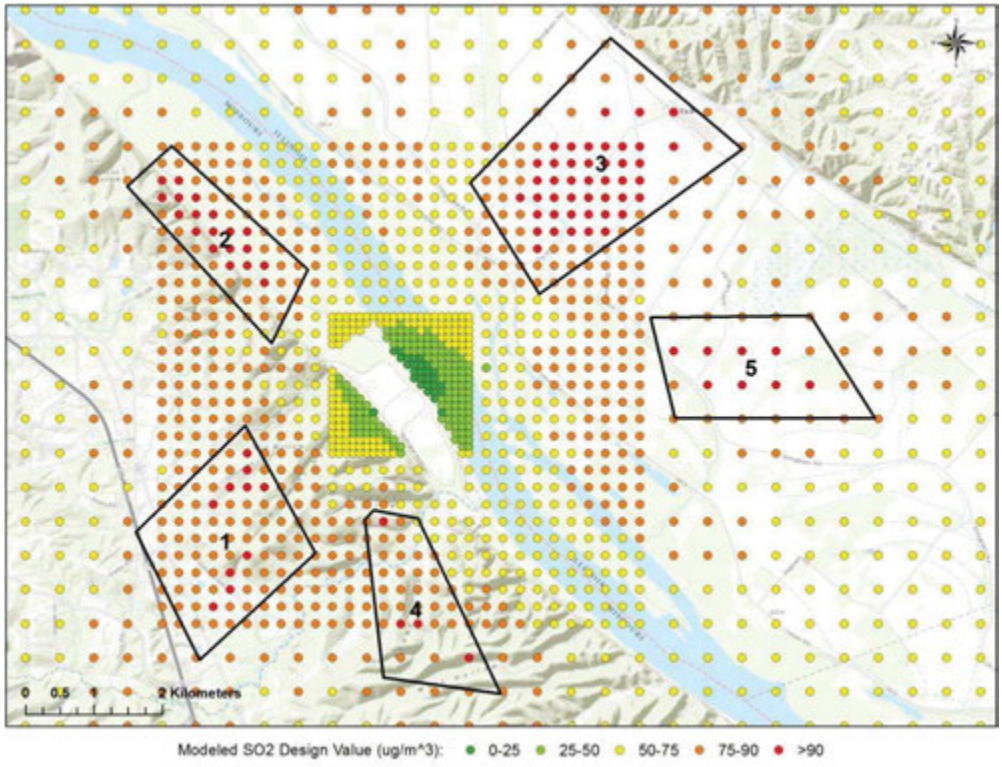

Figure 2. DNR model results and polygons drawn around high concentration areas.

Table 1. Number of high concentration receptors in DNR's polygons.

	Polygon 1	Polygon 2	Polygon 3	Polygon 4	Polygon 5
# of Receptors >90 ug/m^3	10	18	45	4	8
Ranking: 3>2>1>5>4					

Based on this analysis, DNR concluded that polygons 3 and 2, which contained the highest and second-highest number of high concentration receptors, represented "areas of maximum concentration" and were therefore "candidates for the location of SO_2 monitors."[23] It then determined, based on a qualitative analysis of wind speed and direction and the number of high

[23] 2015 Monitoring Network Plan, Appendix 5, Review of Proposed SO_2 and Meteorological Monitoring Stations Around Ameren Missouri's Rush Island Energy Center, at 4.

concentration receptors in the remaining three polygons (i.e., 1, 4 and 5), that polygon 1 was the best candidate of the remaining three for the location of a third SO_2 monitor. Based on these findings, DNR concluded that because the three new monitoring sites proposed by Ameren are located within polygons 1, 2 and 3, they are within areas where peak SO_2 concentrations are expected to occur and are therefore appropriately sited.

However, because DNR used a telescoping receptor grid, and because the polygons it drew to indicate areas of high concentration are located in a region where the receptor grid spacing varies from 250 to 500 meters, DNR's counts of high concentration receptors in each polygon and its subsequent ranking of the polygons based on those counts are significantly biased. Some of DNR's polygons are likely to have more high concentration receptors than others just by virtue of the fact that the receptors in those polygons are spaced more closely together than they are in other polygons. For example, almost all of the receptors in polygons 1 and 2 are spaced 250 meters apart, whereas all of the receptors in polygon 5 are spaced 500 meters apart. As a result there are many more receptors – including more high concentration receptors – in polygons 1 and 2 than in polygon 5 despite the fact that all three polygons are similar in size (polygon 5 is slightly larger than polygon 2 and slightly smaller than polygon 1).

One way to eliminate the counting bias resulting from DNR's use of a telescoping receptor grid is by ranking the polygons based on the percentage instead of the absolute number of high concentration receptors within each one. This effectively adjusts for the fact that certain polygons, e.g., polygons 1 and 2, are likely to have more high concentration receptors than others, e.g., polygon 5, just by virtue of the fact that the receptors in those polygons are spaced more closely together. The results of this analysis are summarized in Table 2 below. Polygon 3 is still ranked the highest. However, polygon 5 is ranked second-highest instead of polygon 2, which drops to third-highest – displacing polygon 1 from the top three.

Table 2. Percentage of high concentration receptors in DNR's polygons.

	Polygon 1	Polygon 2	Polygon 3	Polygon 4	Polygon 5
% of Receptors >90 ug/m^3	15	44	67	14	62
Ranking: 3>5>2>1>4					

A better way to eliminate the counting bias resulting from DNR's use of a telescoping receptor grid is to replace the telescoping grid with a uniform grid so the receptor spacing is the same in all five polygons. To determine how this would affect receptor counts and polygon ranks, we re-ran DNR's model using a uniform 250-meter receptor spacing and analyzed the results using DNR's methodology. The results are shown in Figure 3 below, and the number of high concentration receptors in each polygon and the ranking of polygons from highest to lowest in terms of the number of high concentration receptors they contain are summarized in Table 3 below. We also ranked the polygons based on the percentage instead of the absolute number of

high concentration receptors within each one. The results of this analysis are summarized in Table 4 below.

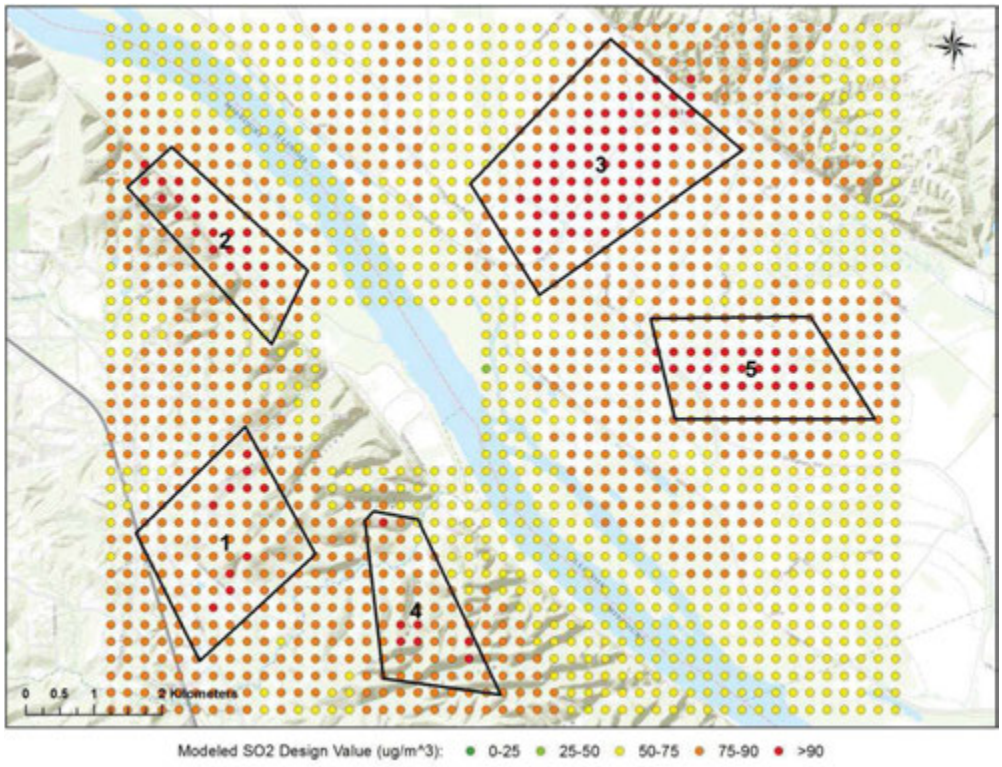

Figure 3. DNR model results for uniform 250-meter receptor grid.

Table 3. Number of high concentration receptors in DNR's polygons when modeled with a uniform receptor grid.

	Polygon 1	Polygon 2	Polygon 3	Polygon 4	Polygon 5
# of Receptors >90 ug/m^3	10	20	63	7	22
Ranking: 3>5>2>1>4					

Table 4. Percentage of high concentration receptors in DNR's polygons when modeled with a uniform receptor grid.

	Polygon 1	Polygon 2	Polygon 3	Polygon 4	Polygon 5
% of Receptors >90 ug/m^3	14	45	55	16	39
Ranking: 3>2>5>4>1					

When modeled with a uniform receptor grid, the three highest ranking polygons – both in terms of the number and percentage of high concentration receptors they contain – are 2, 3 and 5, **not** 1, 2 and 3 as DNR's flawed analysis concluded. These are the areas predicted to have the highest modeled impacts and thus where SO_2 monitoring sites should be located. An analysis of the top 10, 25, and 50 receptors supports this conclusion. All but one of the top 10 receptors are located within polygon 3, all but one of the top 25 receptors are located within polygons 2 and 3, and all but one of the top 50 receptors are located within polygons 2, 3 and 5. This is shown in Figure 4 below, which includes a filled contour plot of modeled design values that clearly shows how much larger the peak concentration areas are in polygons 2, 3 and 5 compared to the other polygons.

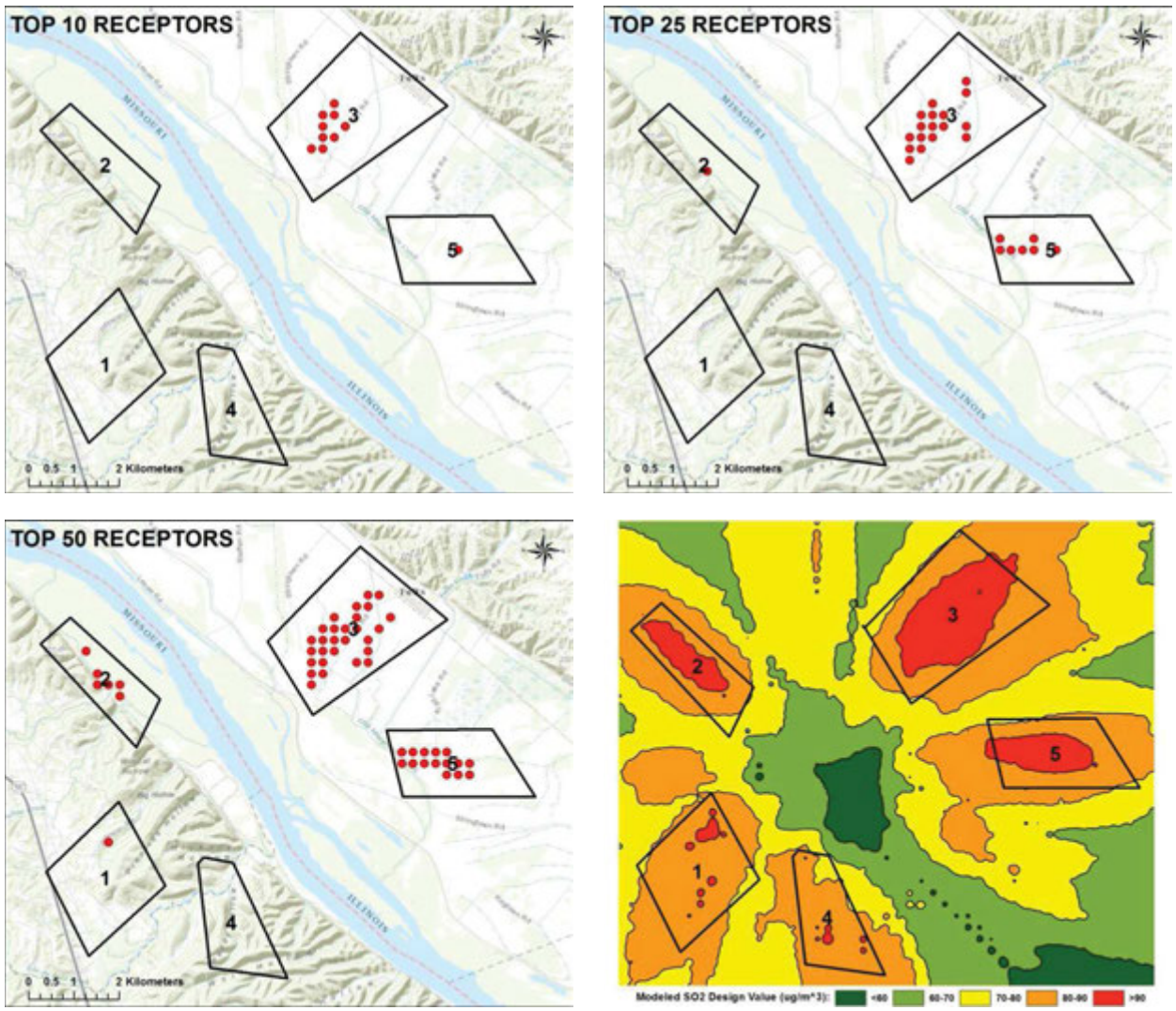

Figure 4. Top 10, 25 and 50 receptors and filled contour plot of modeled design values.

The locations of Ameren's proposed SO_2 monitoring sites – dubbed Fults, Natchez and Weaver-AA – relative to DNR's polygons are shown in Figure 5 below. Of the three proposed sites, only the Fults site, which is inside the peak concentration area within polygon 3, is properly located. The Weaver-AA site, which Figure 2 of Monitoring Network Plan Appendix 5 incorrectly shows being within polygon 2, is actually located outside of it based on the site coordinates provided in Plan Appendix 1. Hence it is not properly located. Nor is the Natchez site, which should be located within polygon 5 instead of polygon 1 because polygon 5 has higher modeled impacts.

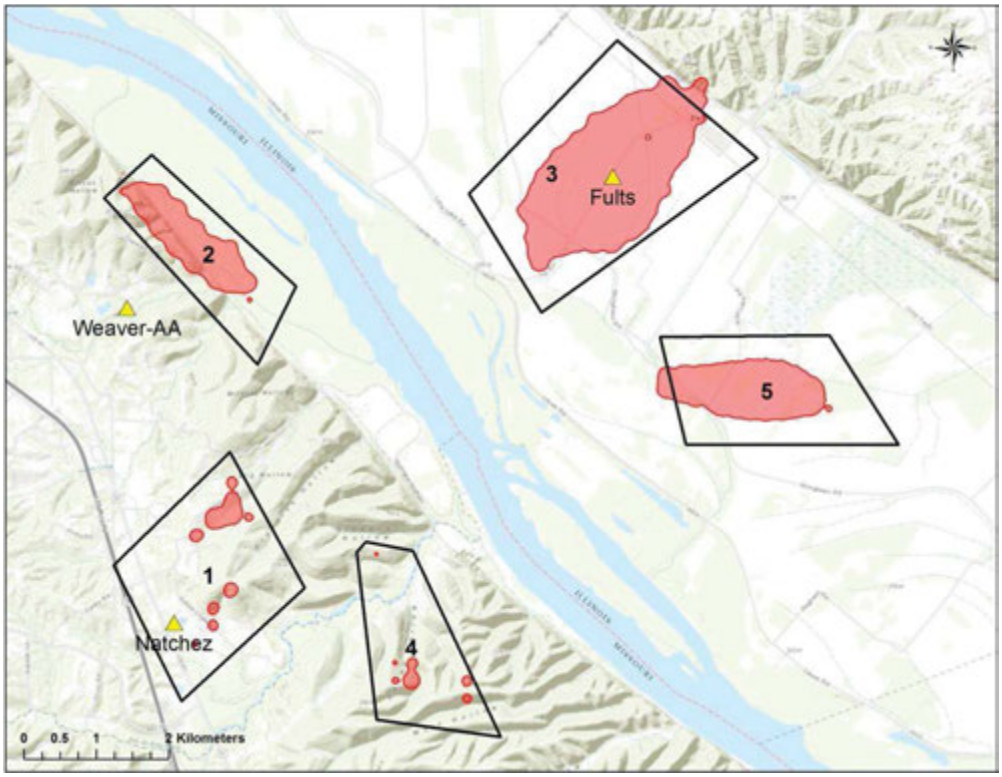

Figure 5. Ameren's proposed SO_2 monitoring sites relative to DNR's polygons. Peak concentration areas (>90 ug/m^3) are shaded red.

Because they are not properly located, neither the Natchez nor Weaver-AA monitoring sites will adequately represent Rush Island's SO_2 air quality impact. Therefore, both sites should be relocated. The Weaver-AA site should be located inside the peak concentration area within polygon 2 and the Natchez site should be located inside the peak concentration area within polygon 5 as shown in Figure 6 below. Alternatively, the Natchez site could be moved inside the peak concentration area within polygon 1 and a fourth monitor added inside the peak concentration area within polygon 5 as shown in Figure 7 below. The recommended monitor locations shown in Figures 6 and 7 are easily accessible and appear to meet EPA siting criteria and have ready access to power.

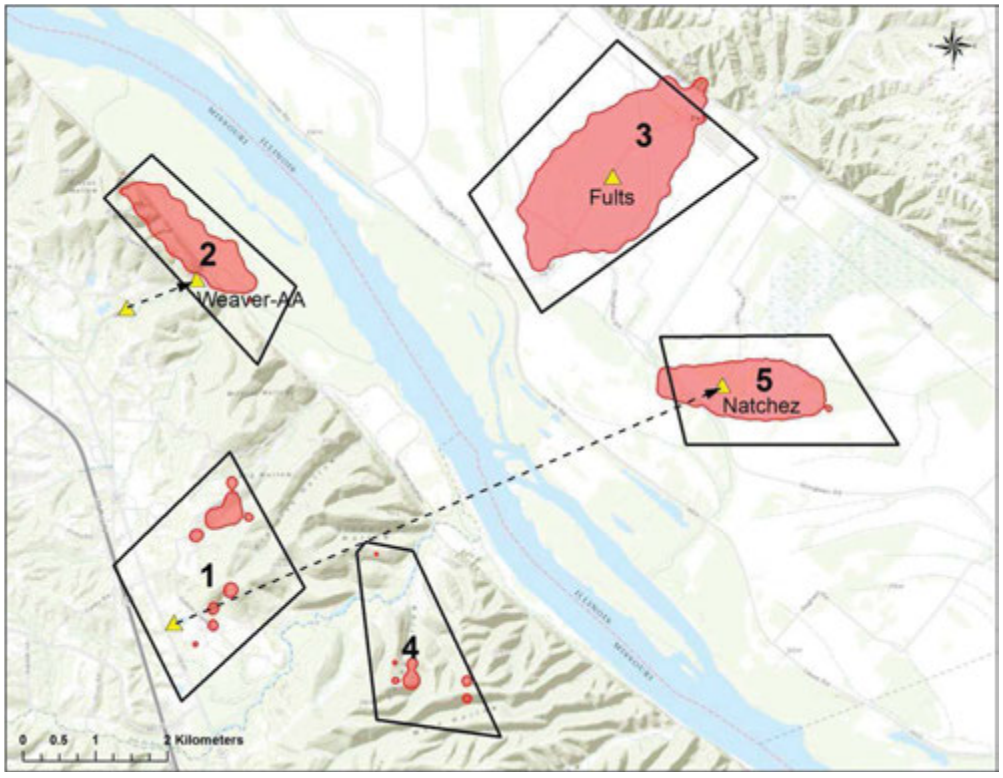

Figure 6. Appropriately located Rush Island monitors (three monitor configuration).

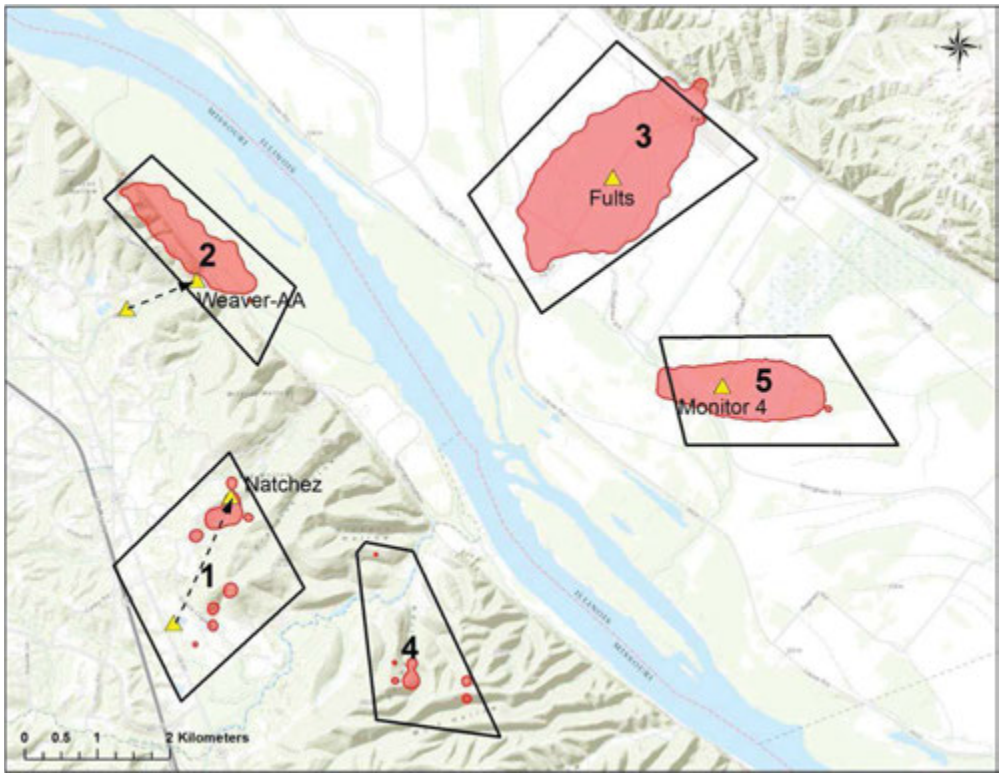

Figure 7. Appropriately located Rush Island monitors (four monitor configuration).

IV. Conclusion

For the reasons set forth above, DNR should withdraw the proposed Labadie SO_2 monitoring sites and EPA should not approve the 2015 Monitoring Network Plan with the inclusion of such sites pending the completion of the Labadie area designation process and the performance of appropriate modeling to determine the areas of peak ambient SO_2 concentrations around the plant using current EPA guidance. With respect to the Rush Island monitoring sites in the 2015 Monitoring Network Plan (and the Labadie monitoring sites if DNR does not withdraw them), DNR should not submit the plan to EPA, and EPA should not approve it, unless and until the proposed monitoring sites are relocated to areas of expected peak ambient SO_2 concentrations.

Sincerely yours,

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June 28, 2016

Missouri Department of Natural Resources
Air Pollution Control Program
Air Quality Analysis Section/Air Monitoring Unit
P.O. Box 176
Jefferson City, MO 65102
Via email to: cleanair@dnr.mo.gov

Re: 2016 Monitoring Network Plan

To whom it may concern:

Submitted on behalf of Sierra Club, these comments urge the Missouri Department of Natural Resources ("DNR") to revise its 2016 Monitoring Network Plan[1] to require Ameren to make significant changes to its sulfur dioxide ("SO_2") monitoring networks at the Labadie and Rush Island power plants. As DNR is expected to submit its 2016 Plan to the U.S. Environmental Protection Agency ("EPA") for review and approval shortly after the close of the comment period, these comments also urge EPA to reject most of the 2016 Plan's SO_2 monitoring locations at the Labadie and Rush Island plants. With one or two possible exceptions, Ameren's monitors are not located in areas of expected peak ambient SO_2 concentrations. Accordingly, they do not satisfy applicable requirements for "SLAMS … or SLAMS-like" monitors.[2]

This letter highlights the following key points:

- Ameren selected the monitoring locations at both Labadie and Rush Island. But according to Ameren's own modeling, most of Ameren's monitoring locations are not in areas of expected peak ambient SO_2 concentrations.
- DNR has not done due diligence in reviewing and accepting Ameren's monitoring locations. DNR offers no independent support for Ameren's Labadie locations, and its purported support for the Rush Island locations actually undermines the propriety of those locations.
- Based on currently available modeling, one or both of the Labadie monitoring sites and two of the three Rush Island monitoring sites are unlikely to capture maximum ambient SO_2 concentrations because they are not located in areas where peak ambient SO_2 concentrations are expected to occur.

[1] Missouri Department of Natural Resources, Air Pollution Control Program, 2016 Monitoring Network Plan (May 27, 2016) ("2016 Monitoring Network Plan" or "2016 Plan").
[2] U.S. Environmental Protection Agency ("EPA"), Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS); Final Rule ("DRR"), 80 Fed. Reg. 51052, 51072 (Aug. 21, 2015).

I. DNR's 2016 Monitoring Network Plan Does Not Comply With Applicable Legal Requirements.

Source-oriented ambient SO_2 monitors must be sited in areas of expected peak 1-hour SO_2 concentrations.[3] EPA guidance highlights the need for detailed analysis to support the appropriate location of ambient SO_2 monitors:

> The EPA suggests that the more data and analysis that goes into a source-oriented monitoring site evaluation process, the greater the confidence in how appropriate the resulting monitoring network proposal will be in supporting the objectives of the DRR. Air agencies electing to use monitoring as a means of satisfying the DRR or other source-oriented monitoring activity are expected to provide adequate reasoning in a monitoring network proposal. Such a network proposal would characterize an area around or impacted by an identified SO_2 source and include the identification of one or more locations where peak 1-hour SO_2 concentrations are expected to occur.[4]

In its 2015 Monitoring Network Plan, DNR labeled Ameren's Labadie and Rush Island SO_2 monitors as Special Purpose Monitors for the stated reason that the Data Requirements Rule had not yet been issued in final form, while making it clear that the monitors were intended to serve as SLAMS monitors. "Once the rule is finalized, it is the intention to convert these monitors to SLAMS."[5] In approving DNR's 2015 Monitoring Network Plan, EPA indicated that it had not evaluated Ameren's Labadie and Rush Island monitors but would do so after DNR acted on its stated intention to convert them to SLAMS monitors.[6]

DNR's 2016 Monitoring Network Plan changes course: "Despite EPA's previous recommendation to classify these monitors as SLAMS, … we have decided to classify the Labadie and Rush Island SO_2 monitors as industrial SO_2 monitors."[7] DNR erroneously relies on EPA's statement that state agencies may rely on data collected from third-party operated monitors provided the monitors comply with the data quality and assurance requirements of EPA's ambient monitoring regulations. However, DNR conveniently ignores EPA's statement that, regardless of whether an ambient source-oriented SO_2 monitor is operated by a government, industry, or other third party, "[t]he critical issue is that the monitor or monitors must be either a SLAMS monitor or SLAMS-like monitor."[8] EPA's numerous statements about the need for states to perform due diligence to support the location and number of monitors, and the need for discussing these items with EPA in advance of making decisions, underscores the fact that, if states plan to use third-party monitors for regulatory NAAQS designation or compliance

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[3] 40 C.F.R. Part 58, Appendix D, § 1.1.1(a), (c); 40 C.F.R. § 51.1203(b); DRR, 80 Fed. Reg. at 51055, 51057, 51083, 51085; In the Matter of Union Electric Company d/b/a Ameren Missouri, No. APCP-2015-034, Consent Agreement between DNR and Ameren Missouri (Mar. 23, 2015), Appendix 1, ¶b (Appendix J to DNR's pending SIP for the Jefferson County Sulfur Dioxide Nonattainment Area). See also EPA, SO2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document (Feb. 2016, Draft) ("Monitoring TAD") at i, 2, 10, 15.
[4] Monitoring TAD at 10.
[5] Missouri Department of Natural Resources, Air Pollution Control Program, 2015 Monitoring Network Plan (June 12, 2015) ("2015 Monitoring Network Plan") at 12.
[6] EPA, Region 7 (Mark Hague), letter to DNR (Kyra Moore) (Jan. 25, 2015).
[7] 2016 Monitoring Network Plan at 17.
[8] DRR at 51072.

decisions, the monitors must meet all of the substantive requirements of SLAMS monitors. Ameren's Labadie and Rush Island monitors do not, as they are not sited in areas of expected peak ambient SO_2 concentrations.

II. The Labadie Monitors Are Not Located In Areas of Expected Peak Ambient SO_2 Concentrations.

As demonstrated in comment letters previously submitted on behalf of Sierra Club, one or both of Ameren's Labadie monitors are not in areas of expected peak concentrations, and a third monitor is also needed.[9] Our previous comments, which are attached as Exhibits 1-5 and incorporated herein by reference, highlighted the following key points:

- Ameren's original modeling to site the monitors identified three distinct areas where peak 1-hour SO_2 concentrations are expected to occur. These areas are located northwest, northeast, and southeast of the plant and are shown in Figure 1. However, only one of the monitors – the Northwest monitor – is located in one of these areas. No monitor is located in either of the other two peak concentration areas. The Valley monitor is located between the two unmonitored peak concentration areas, at a site where the modeled concentration is approximately 20 percent lower than in the peak areas.
- DNR's modeling for its proposed Labadie designation recommendation, which used newer emissions and meteorological data than Ameren's original modeling, confirmed that the Valley monitor is not located in an expected peak concentration area and predicted an even lower concentration (relative to the peak) at the Valley monitoring site than Ameren's original modeling. This is shown in Figure 2.
- Early on-site meteorological data from the Valley site suggests that meteorological data from the Spirit of St. Louis Airport (KSUS) in nearby Chesterfield may be more representative of meteorological conditions at Labadie than data from the much more distant Jefferson City Memorial Airport (KJEF) in Jefferson City. Like Ameren, DNR used KJEF meteorological data in the modeling it performed for its proposed Labadie designation recommendation. However, if KSUS meteorological data are used instead in light of their greater similarity to the on-site met data, then DNR's modeling shows expected peak concentration areas located south and southwest of the plant. This is shown in Figure 3. Both the Northwest and Valley monitors are located well outside of these areas, where the modeled concentration is more than 25 percent lower than in peak areas.

[9] Comments on Ameren Missouri's Labadie Sulfur Reduction Project Quality Assurance Project Plan (April 13, 2015) (Ex.1); Comments on the 2015 Monitoring Network Plan (July 20, 2015) (Ex.2); Supplemental Comments on the 2015 Monitoring Network Plan (August 11, 2015) (Ex.3); Comments on the 2010 1-Hour Sulfur Dioxide Standard, Proposed Options for Area Boundary Recommendations, July 2016 Designations (September 3, 2015) (Ex.4); Comments on the Proposed Area Designation Under the 2010 SO_2 NAAQS for the Area Around the Labadie Energy Center in Franklin County, Missouri (March 31, 2016) (Ex.5).

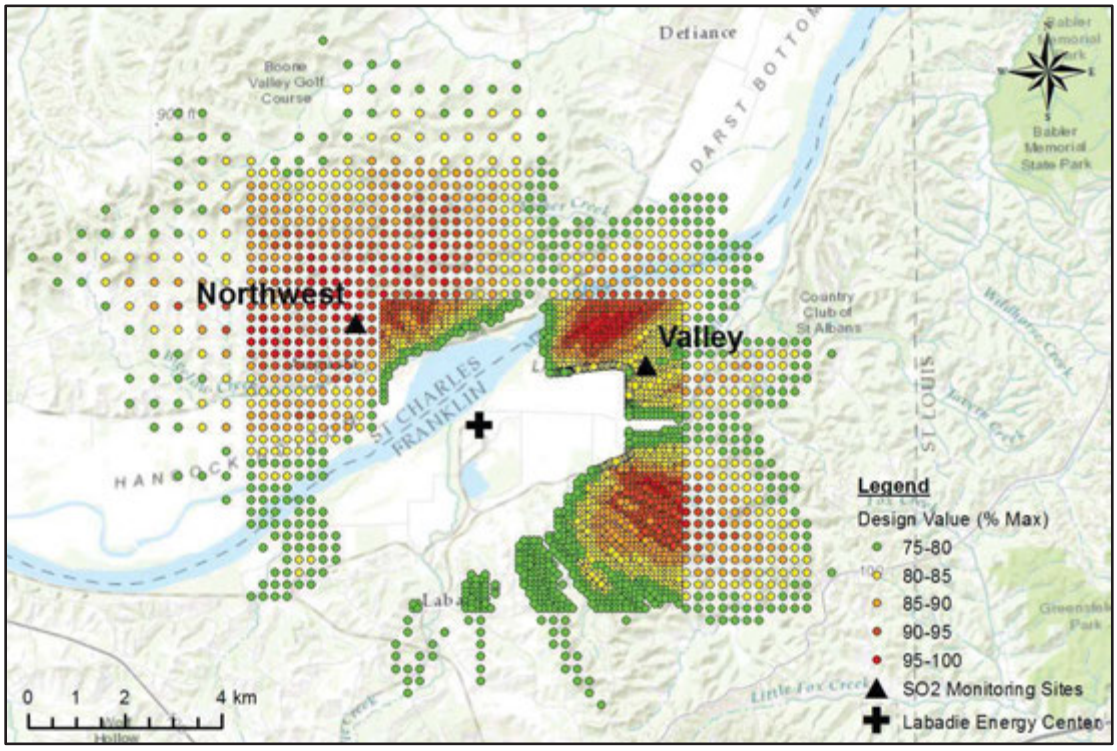

Figure 1. Expected peak concentration areas per Ameren's original modeling.

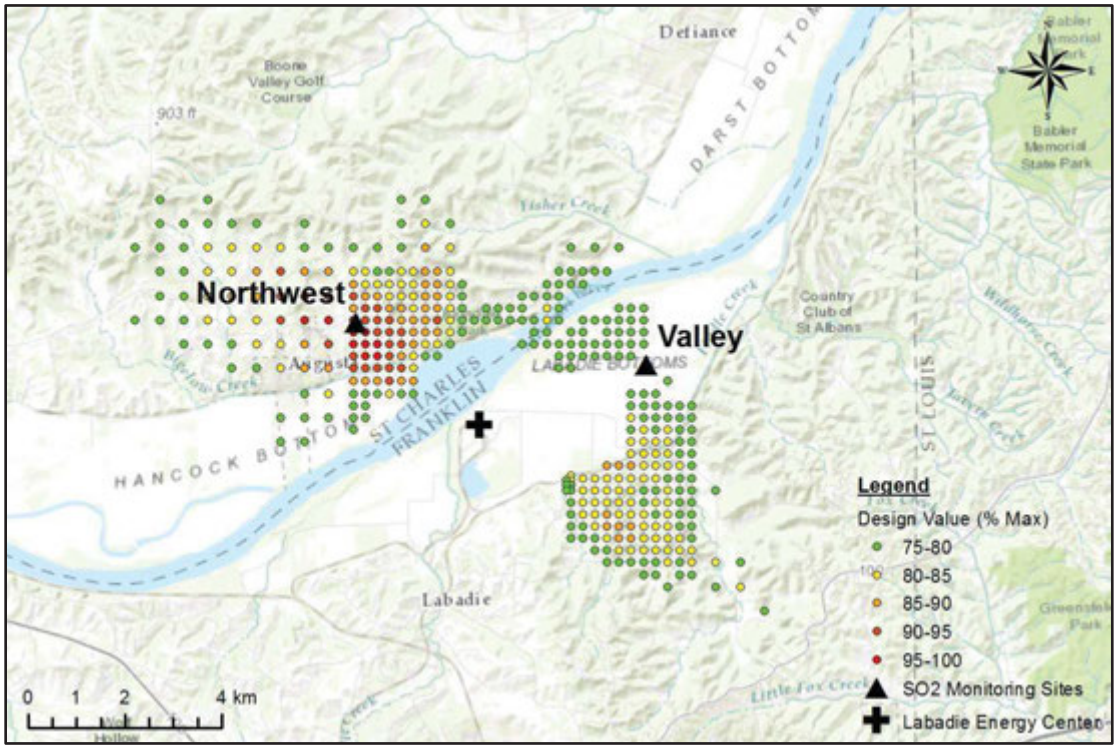

Figure 2. Expected peak concentration areas per DNR's Labadie designation recommendation modeling.

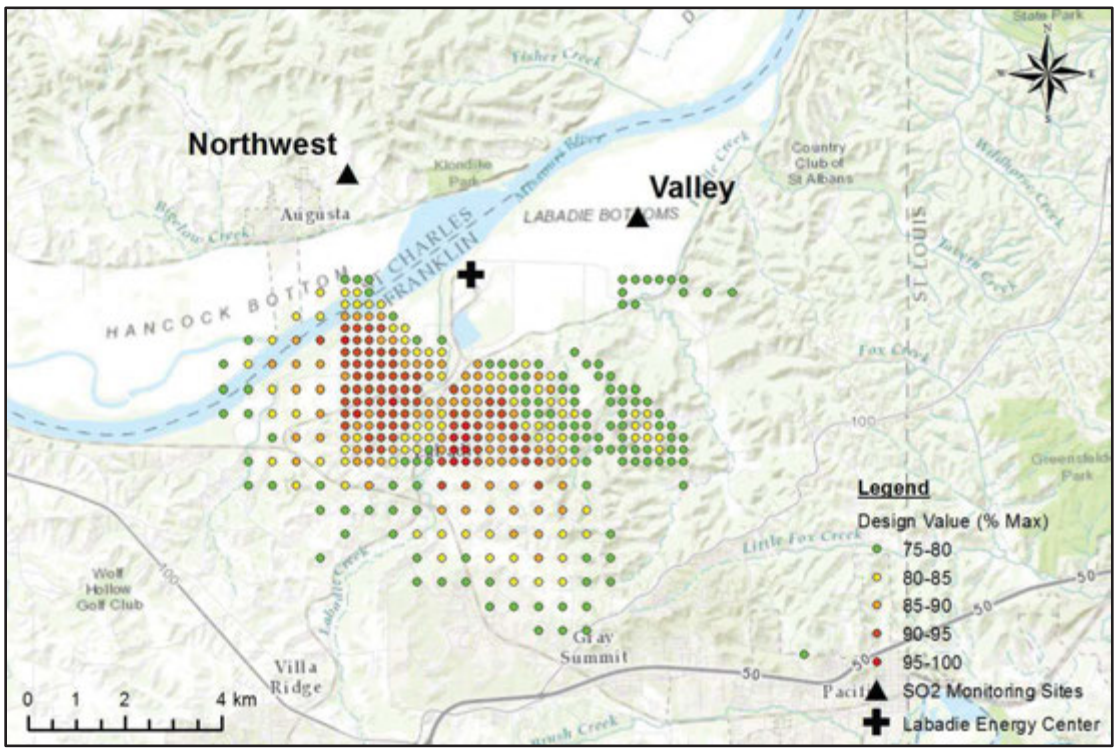

Figure 3. Expected peak concentration areas per DNR's Labadie designation recommendation modeling, using KSUS meteorological data.

III. DNR Has Not Conducted An Independent Modeling Analysis Of Ameren's Labadie Monitoring Sites.

Inexplicably, DNR has not performed an independent modeling analysis of the suitability of Ameren's Labadie monitoring sites. In its 2015 Monitoring Network Plan, DNR only provided Ameren's modeling analysis of the sites.[10] Even though DNR performed independent modeling last year related to its Labadie designation recommendation, it did not use that modeling to evaluate or attempt to justify the Labadie monitoring sites in the 2015 Monitoring Network Plan. And although DNR updated its modeling earlier this year in response to EPA's proposed Labadie designation decision, it still failed to use that updated modeling to assess the siting of Ameren's Labadie monitors in the 2016 Monitoring Network Plan.

Nor has DNR conducted a monitor siting analysis for Labadie using the receptor scoring strategy described in the Monitoring TAD, which was revised last February. This is curious given DNR's contention in the 2016 Monitoring Network Plan that its original Rush Island analysis needed to be updated because it focused solely on modeled design values, and "based on the revised guidance, the site selection process also needs to account for the frequency with which a receptor registers a daily maximum concentration."[11] Like DNR's original Rush Island analysis, Ameren's Labadie analysis did not account for frequency of having the highest 1-hour daily

[10] 2015 Monitoring Network Plan, Appendix 2.
[11] 2016 Monitoring Network Plan, Appendix 2 at 2.

maximum concentration amongst all receptors. Hence, if the revisions to the Monitoring TAD necessitated a supplemental analysis of the Rush Island monitoring sites on those grounds, it necessitates one for the Labadie sites as well. In light of the updated modeling that DNR performed earlier this year in connection with the pending Labadie designation, it needed only to perform an additional model run using the MAXDAILY output option in AERMOD to evaluate the sites using the scoring strategy described in the Monitoring TAD, as it did for the Rush Island monitoring sites.

DNR also should have reevaluated the Labadie monitoring sites in the 2016 Monitoring Network Plan due to various technical issues with Ameren's original analysis. As noted above, DNR relied from the outset on Ameren's modeling analysis, which Ameren provided in the Quality Assurance Project Plan ("QAPP") for what the company ironically dubbed its "Labadie Sulfur Reduction Project." However, Ameren's modeling used constant emission rates and therefore did not comport with the Monitoring TAD, as explained in our April 2015 comments on the QAPP (Ex. 1 attached hereto). It also used 2005-2009 meteorological data and was therefore conspicuously out of date even at the time of submittal.

DNR's approach to the Labadie monitoring sites cannot be squared with EPA's requirements:

> [R]esponsible air agencies are expected to establish a clear rationale for the number and placement of the monitors it is using to satisfy the requirements of the [DRR] rule. In this process, there is flexibility for the state to use professional judgment in determining what is appropriate for their individual situations, but *they are expected to perform due diligence in attempting to locate monitors in the most ideal locations possible*.[12]

IV. Analysis Of The Labadie Monitoring Sites Using The Scoring Strategy Described In The Monitoring TAD Demonstrates That The Valley Monitor Is Improperly Sited And That Additional Monitors Are Needed.

Per the Monitoring TAD, prioritization of receptor locations for consideration as permanent monitoring sites using normalized design values (NDVs) and frequency of having the highest 1-hour daily maximum concentration is accomplished using the following scoring strategy:[13]

1. Calculate the NDV at each receptor and rank from highest to lowest receptor. Rank of 1 means the highest design value.
2. Using the MAXDAILY output option in AERMOD, determine each day's highest normalized concentration and receptor. The MAXDAILY option in AERMOD outputs each receptor's highest concentration for each modeled day.
3. Using the output from step 2, determine the number of days each receptor has the highest concentration for the day among all receptors.
4. Rank the results from step 3 from highest to lowest number of days. Rank of 1 means the highest number of days having the highest daily maximum value.

[12] DRR, 80 Fed. Reg. at 51073 (emphasis supplied).
[13] Monitoring TAD, Appendix A.

5. For each receptor, add the concentration rank and the day rank. The lowest possible score is 2, meaning the receptor was the highest overall NDV and also had the highest number of days where the receptor was the highest concentration for the day amongst all receptors.

Ranking receptors by their resultant scores provides a list of locations ranked in general order of desirability with regard to monitor siting. Lower relative scores indicate a higher probability of experiencing peak 1-hour SO_2 concentrations.

Had DNR analyzed Ameren's Labadie monitoring sites using this strategy in either its original modeling, which used 2012-2014 emissions data, or its updated modeling, which used 2013-2015 emissions data and also included a new variant with a merged stack for units 3 and 4, it would have found – as shown in our comments on the 2015 Monitoring Network Plan (Ex. 2 attached hereto) – that the Valley monitor is not sited in an expected peak concentration area and needs to be relocated. We obtained DNR's original and updated modeling via Sunshine Law request and reviewed the results in order to identify the 300 receptors with the highest modeled design values. Next, as DNR did in its supplemental analysis of the Rush Island monitoring sites, we reran the models for the top 300 receptors using the MAXDAILY output option in AERMOD to determine the maximum 1-hour concentration for each receptor for each day and then tallied the number of days each receptor had the highest 1-hour daily maximum concentration among all receptors.[14] Then, we ranked the top 300 receptors by both design value (concentration rank) and the number of days each had the highest 1-hour daily maximum concentration (day rank) and calculated a score for each one by adding its concentration rank and its day rank. Finally, we ranked the receptors by their scores to create a list of receptor locations in general order of desirability with regard to monitor siting. Figures 4, 5, and 6 show modeled design values and receptor score ranks for the top 300 receptors for DNR's original and updated modeling.

Note that in these and most subsequent figures, receptor color indicates concentration (as a percentage of the maximum modeled design value) and receptor size denotes either frequency of having the highest 1-hour daily maximum concentration, score (concentration rank plus day rank), or score rank

[14] Like DNR, we used actual rather than normalized design values, but that does not affect the outcome of the analysis.

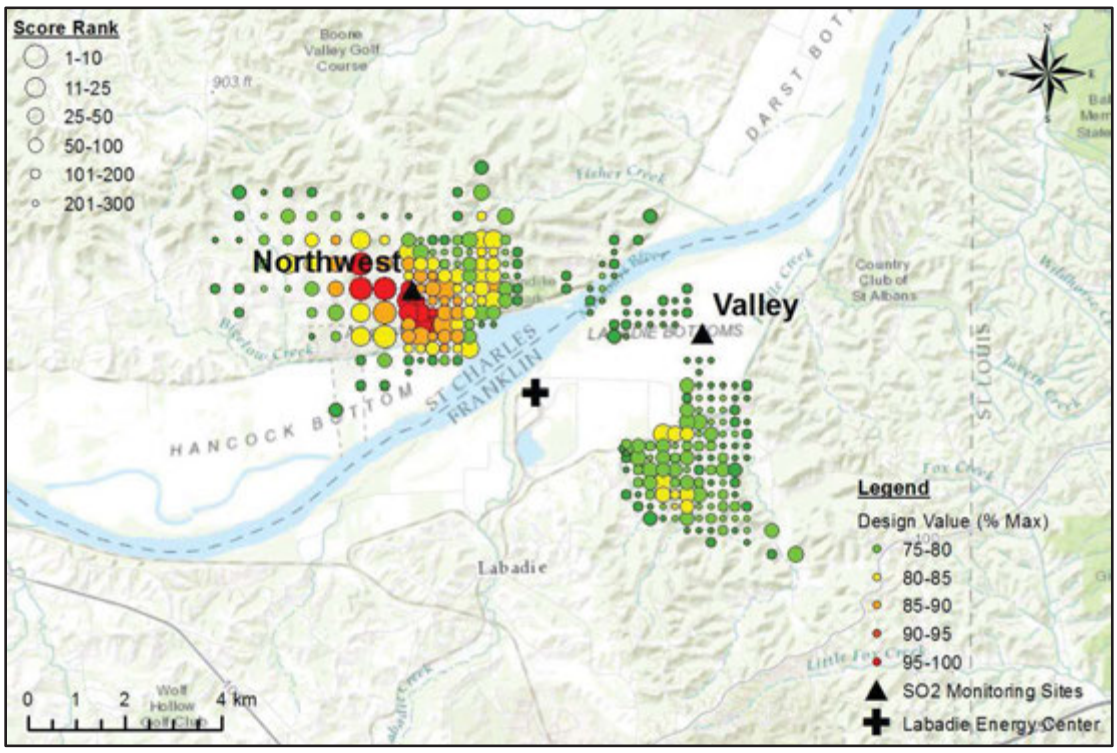

Figure 4. Design values and score ranks for the top 300 receptors, DNR modeling based on 2012-2014 emissions.

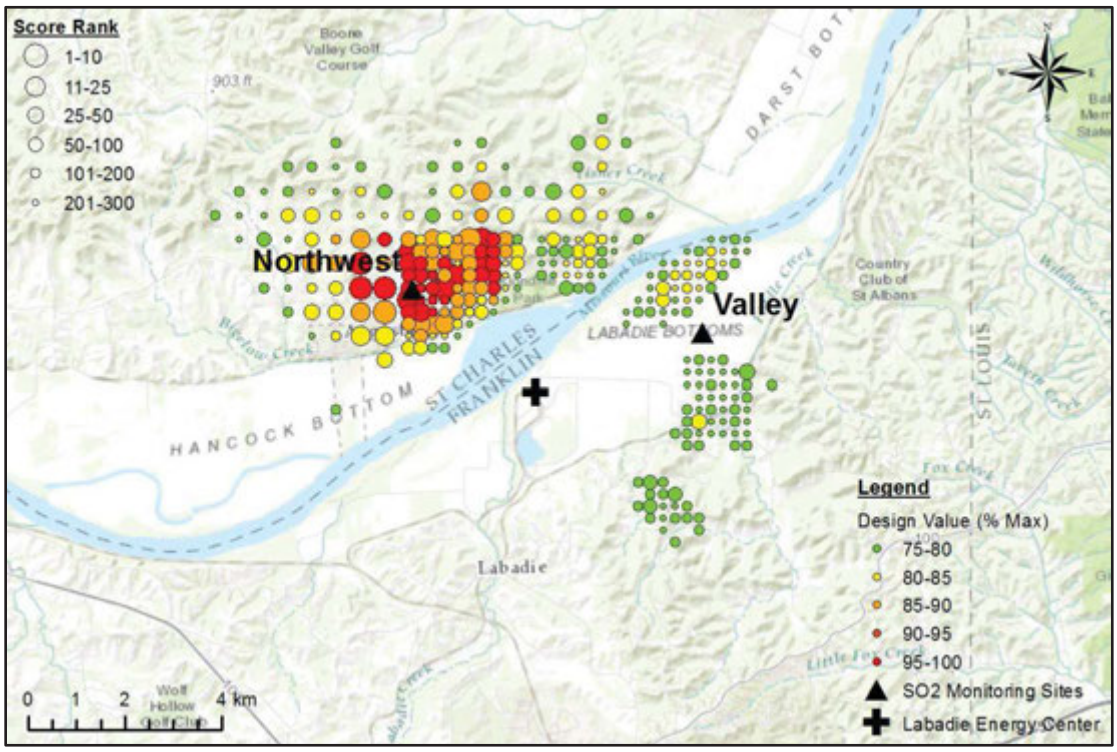

Figure 5. Design values and score ranks for the top 300 receptors, DNR modeling based on 2013-2015 emissions and separate stacks for units 3 and 4.

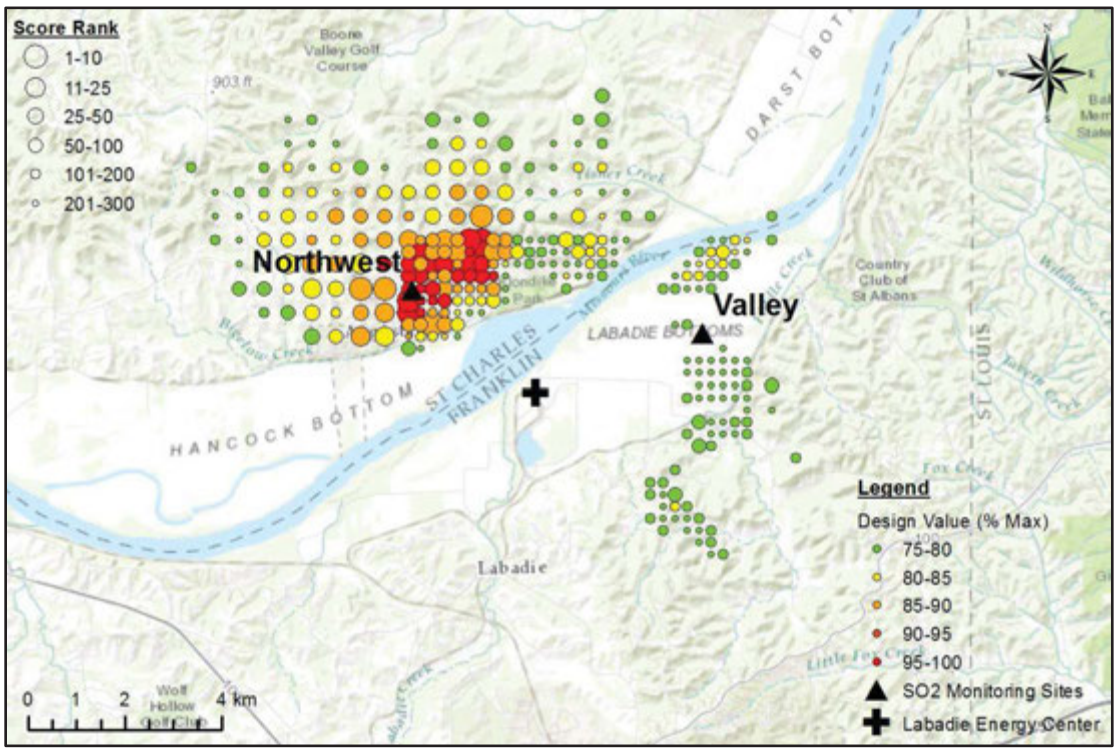

Figure 6. Design values and score ranks for the top 300 receptors, DNR modeling based on 2013-2015 emissions and merged stacks for units 3 and 4.

Figures 4, 5, and 6 all show that while the Northwest monitor is sited in an area with high modeled design values and numerous highly ranked receptors, the Valley monitor clearly is not. Regardless of which modeling is used in the analysis, the Valley monitor is sited in an area where there are no top 300 receptors and where the modeled design value is generally less than 75% of the maximum. As such, its location is not on the prioritized list of receptor locations for permanent monitoring sites developed using the scoring strategy described in TAD, and DNR should require that it be moved to a location that is. Figure 4 (based on DNR's modeling with 2012-2014 emissions) shows a large cluster of highly-ranked receptors, including several in the top 25 and many in the top 50, south of the Valley monitor, while Figures 5 and 6 (based on DNR's modeling with 2013-2015 emissions) show a smaller cluster of top 100/200 receptors north of the Valley monitor. It should be noted that, as we discussed in our April 2015 comments on the Labadie QAPP, Ameren's original analysis of the Labadie monitoring sites showed very high modeled design values in both of these areas, yet Ameren still chose to site the Valley monitor where modeled design values were considerably lower.

A similar analysis of Ameren's most recent modeling supports not only relocating the Valley monitor but also adding at least one monitor southwest of the plant. In late March, in response to the EPA's proposed nonattainment designation for Labadie, Ameren submitted a host of new modeling runs using 2013-2015 emissions data. Half of the new runs used a non-default beta option in AERMOD that EPA has not approved for use at Labadie. Therefore, we did not analyze those runs. Of the four remaining runs, all of which appropriately used AERMOD's regulatory default options, two used meteorological data from the same National Weather

Service ("NWS") station that DNR used (Jefferson City Memorial Airport (KJEF)). Figures 7 and 8 show modeled design values and receptor score ranks for the top 300 receptors for these runs. The other two runs used meteorological data from the NWS station at Spirit of St. Louis Airport (KSUS). Figures 9 and 10 show modeled design values and receptor score ranks for the top 300 receptors for these runs.

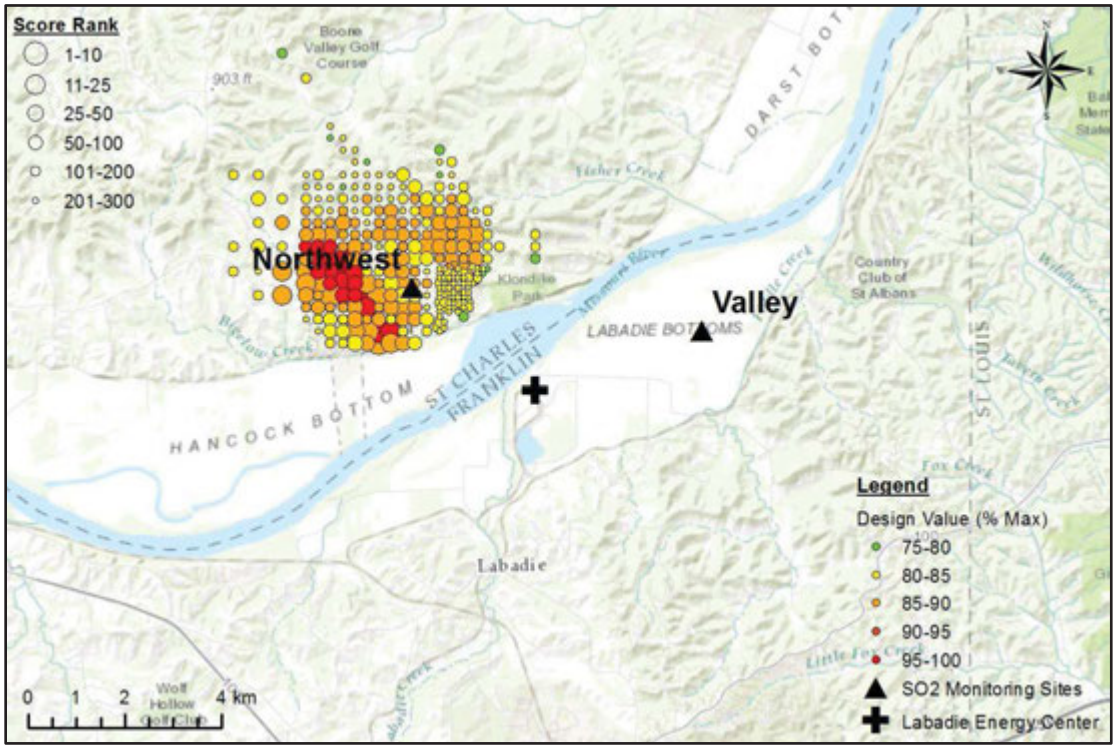

Figure 7. Design values and score ranks for the top 300 receptors, Ameren modeling based on 2013-2015 emissions, KJEF met, and East St. Louis background.

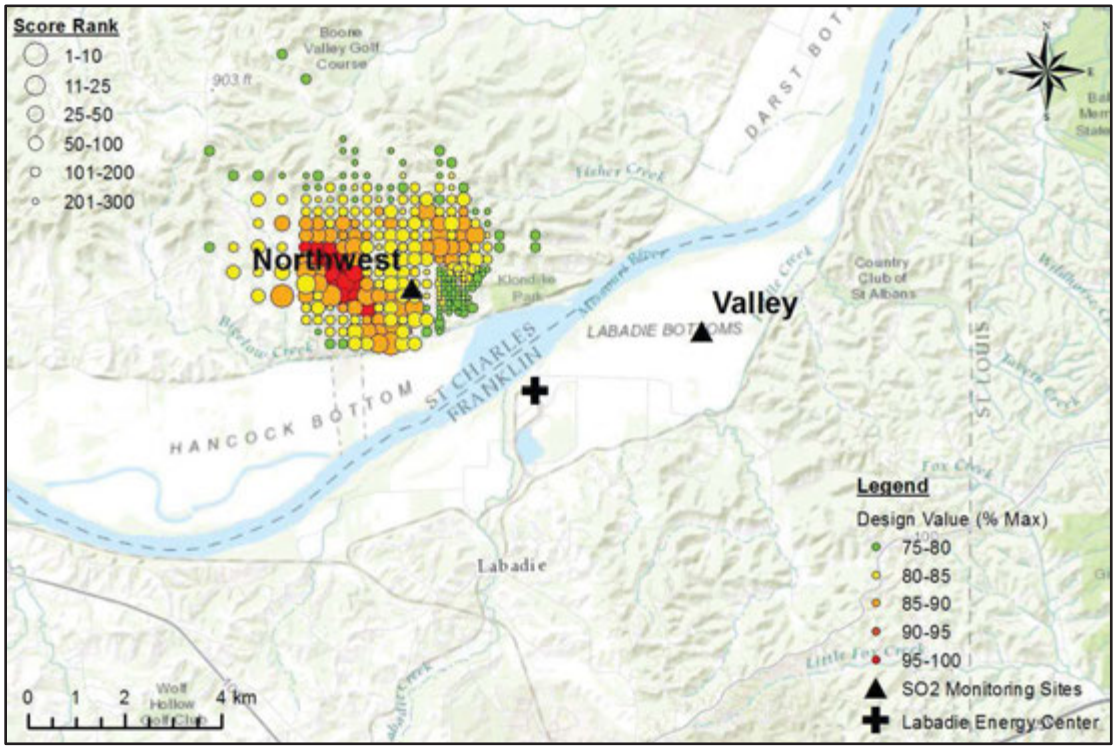

Figure 8. Design values and score ranks for the top 300 receptors, Ameren modeling based on 2013-2015 emissions, KJEF met, and Nilwood background.

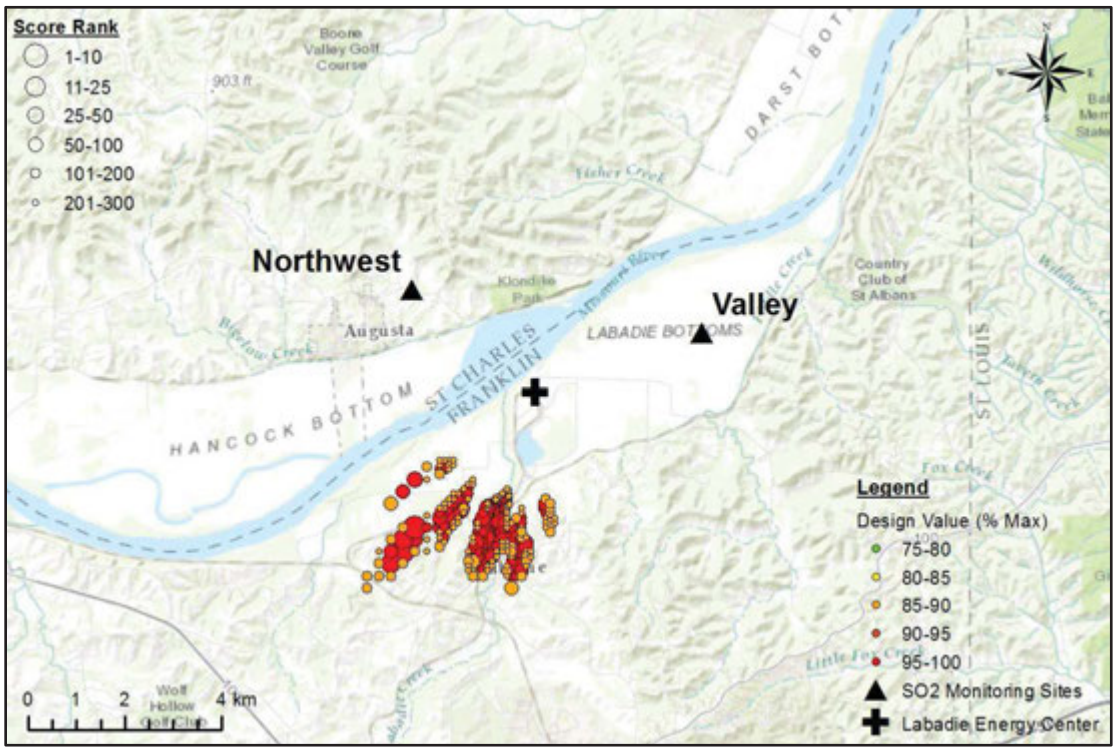

Figure 9. Design values and score ranks for the top 300 receptors, Ameren modeling based on 2013-2015 emissions, KSUS met, and East St. Louis background.

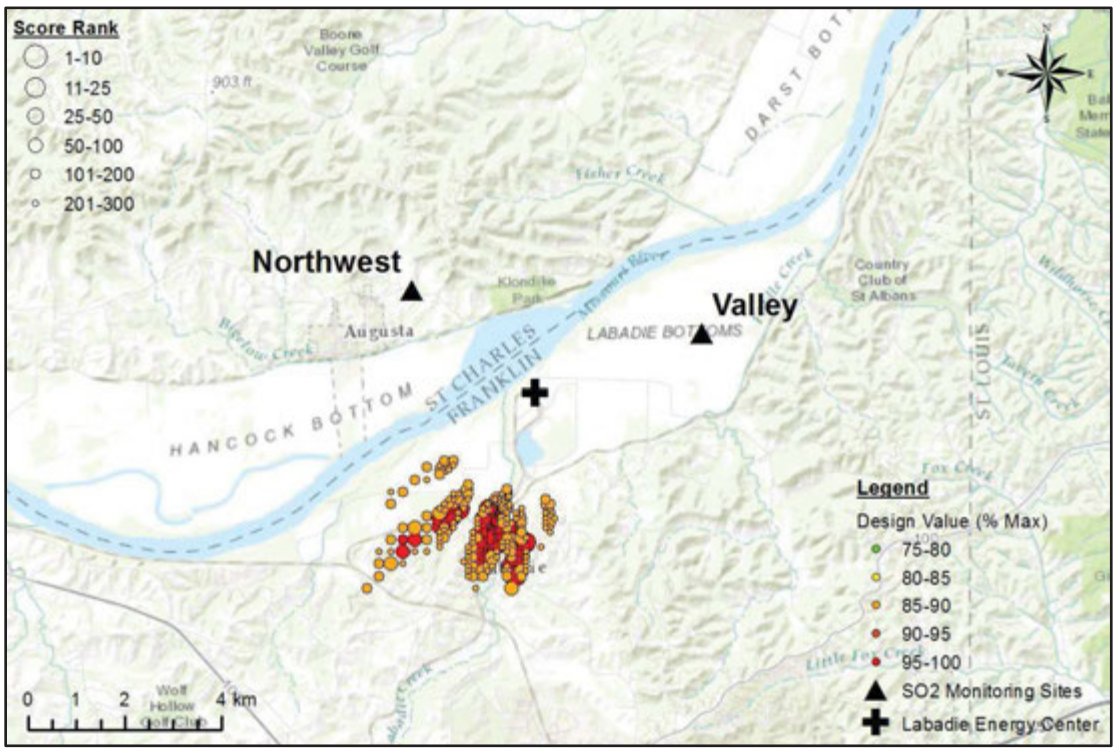

Figure 10. Design values and score ranks for the top 300 receptors, Ameren modeling based on 2013-2015 emissions, KSUS met, and Nilwood background.

Because Ameren used a much finer receptor spacing than DNR, Ameren's top 300 receptors are much more concentrated than DNR's, limiting to some degree the conclusions that can be drawn from Ameren's modeling without swapping out Ameren's receptor grid for DNR's and re-running Ameren's models. Still, Figures 7 and 8 show that based on Ameren's KJEF model runs, the Valley monitor is sited where there are no highly ranked receptors and the modeled design value is less than 75% of the maximum. Hence, these runs support the conclusion – drawn from our analysis of DNR's latest modeling – that the Valley monitor should be relocated.

Figures 9 and 10, on the other hand, show that based on Ameren's KSUS model runs, *neither* of the Labadie monitors is sited in an expected peak concentration area. The highest modeled design values, as well as the highest ranked receptors, are located south-southwest of the plant. There are no highly ranked receptors, and modeled design value are generally less than 75% of the maximum, at both the Valley and Northwest monitoring sites. As demonstrated in our supplemental comments on the 2015 Monitoring Network Plan (Ex. 3 attached hereto) preliminary meteorological data from the Valley site indicate that KSUS meteorological data is more representative of meteorological conditions at Labadie than KJEF meteorological data. Given that expected peak concentration areas are dramatically different when KSUS meteorological data are used, DNR should require one or more additional monitors in the peak concentration areas shown in Figures 9 and 10 in addition to the two existing monitors (one of which should be relocated). Failure to monitor these areas would result in failure to detect ground-level SO_2 concentrations maxima if KSUS meteorological data ultimately prove more representative of the area than KJEF meteorological data.

V. DNR's Supplemental Analysis Of The Rush Island Monitoring Sites Does Not Follow EPA Guidance.

The 2015 Monitoring Network Plan included Ameren's modeling and justification for the locations of three Rush Island monitors as well as an independent modeling analysis by DNR. DNR stated that it undertook its analysis to determine whether the monitors, which were sited by Ameren, "will adequately represent … Rush Island Energy Center's SO_2 air quality impact," and it concluded that they are "within … areas predicted to have the highest and most frequent modeled impacts" and are therefore "reasonable."[15] However, as demonstrated in comment letters previously submitted on behalf of Sierra Club, two of Ameren's Rush Island monitors are not in areas of expected peak concentrations.[16] Our previous comments, which are attached as Exhibits 2 and 6 and incorporated herein by reference, highlighted the following key points:

- Ameren's modeling for its analysis of SO_2 and meteorological monitoring sites around Rush Island identified one large and four smaller areas where peak 1-hour SO_2 concentrations are expected to occur. These areas are shown in Figure 11. However, none of the Rush Island monitors are located in the large peak concentration area south of the plant, which is also where the highest modeled concentrations occur. Furthermore, while two of the monitors – Fults and Natchez – are located on the periphery of two of the smaller expected peak concentration areas, the Weaver-AA monitor is not located in an expected peak concentration area at all.
- DNR's independent analysis of the Rush Island monitoring sites used a flawed methodology that biased the results. When corrected, DNR's analysis shows that only the Fults monitor is located in an expected peak concentration area and both the Natchez and Weaver-AA monitors are not.

[15] 2015 Monitoring Network Plan, Appendix 5 at 1, 7-8.
[16] Comments on the 2015 Monitoring Network Plan (July 20, 2015) (Ex.2); Comments on Ameren Missouri's Analysis of SO_2 and Meteorological Monitoring Stations Around Its Rush Island Energy Center (May 29, 2015) (Ex.6).

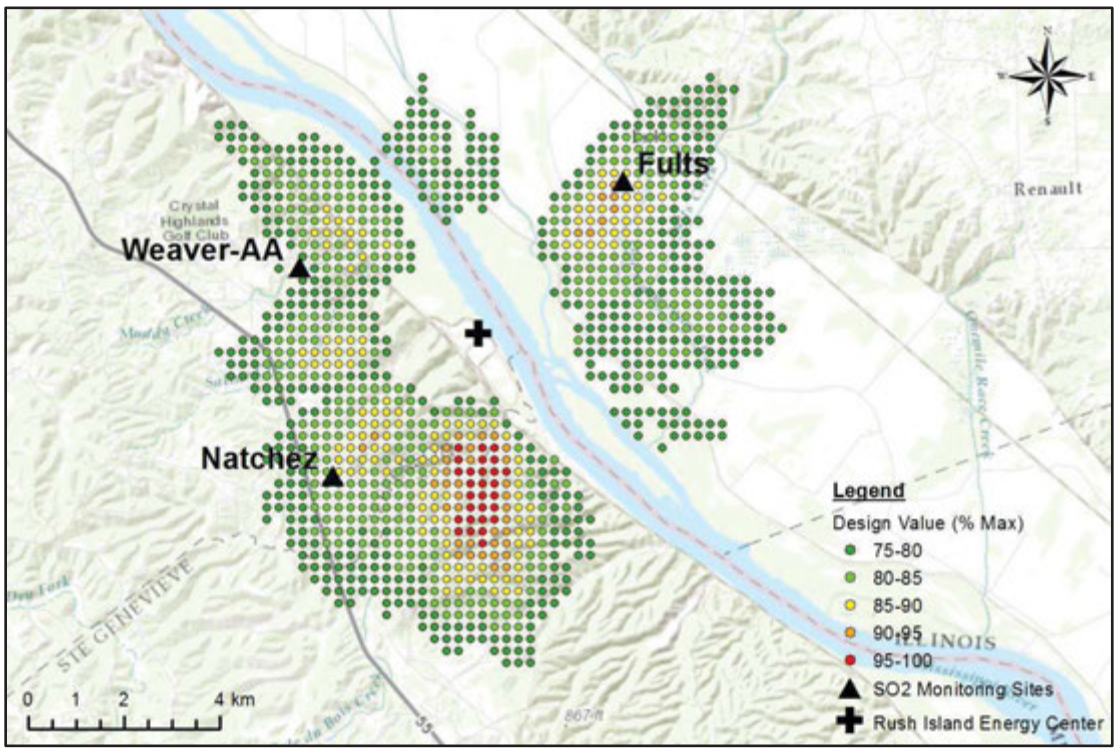

Figure 11. Expected peak concentration areas per Ameren's modeling for its analysis of SO_2 and meteorological monitoring sites around Rush Island.

The 2016 Monitoring Network Plan includes a supplemental analysis by DNR of the Rush Island monitoring sites. The purpose of the supplemental analysis was to update the modeling performed for DNR's original analysis to address the February 2016 revisions to the Monitoring TAD, which includes an option for creating a relative prioritized list of receptor locations for permanent monitoring sites using normalized design values (NDVs) and frequency of having the highest 1-hour daily maximum concentration amongst all receptors. According to DNR, it needed to update its modeling because its original analysis focused solely on modeled design values, and "based on the revised guidance, the site selection process also needs to account for the frequency with which a receptor registers a daily maximum concentration."[17] DNR's supplemental analysis concludes, "This … analysis supports the conclusions from the June 15 report [2015 Monitoring Network Plan]. The locations of the … monitoring sites are reasonable and in agreement with the air program's analysis."[18]

It is worth noting that the option to create a relative prioritized list of receptor locations for consideration of permanent monitoring sites using NDVs and frequency of having the highest 1-hour daily maximum concentration is not a new addition to the February 2016 version of the Monitoring TAD. It was in the previous (December 2013) version of the TAD as well, so DNR could have used it for its original analysis of the Rush Island monitoring sites. Why it chose not to and decided to focus instead only on modeled design values without any kind of assessment of

[17] 2016 Monitoring Network Plan, Appendix 2 at 2.
[18] *Id.* at 5.

the frequency with which receptors have the highest 1-hour daily maximum concentration was not explained in the 2015 Monitoring Network Plan.

More importantly, although DNR generally followed the strategy in its supplemental analysis of the Rush Island SO_2 monitoring sites,[19] it omitted the most crucial, final step – ranking receptors according to their score (the sum of concentration rank and day rank). As a result, it ignored the entire purpose of conducting the TAD-suggested prioritization analysis, and its supplemental analysis offers no support for the location of the Rush Island monitors. First, DNR reviewed the modeling performed for its original analysis and identified the 300 receptors with the highest modeled design values. These receptors are shown in Figure 12. Next, it reran its model for the top 300 receptors using the MAXDAILY output option in AERMOD to determine the maximum 1-hour concentration for each receptor for each day and then tallied the number of days each receptor had the highest 1-hour daily maximum concentration among all receptors. The frequency of having the highest 1-hour daily maximum concentration among the top 300 receptors is shown in Figure 13. Finally, it ranked the top 300 receptors by both design value (concentration rank) and the number of days each had the highest 1-hour daily maximum concentration (day rank) and calculated a score for each one by adding its concentration rank and its day rank. These scores are shown in Figure 14.

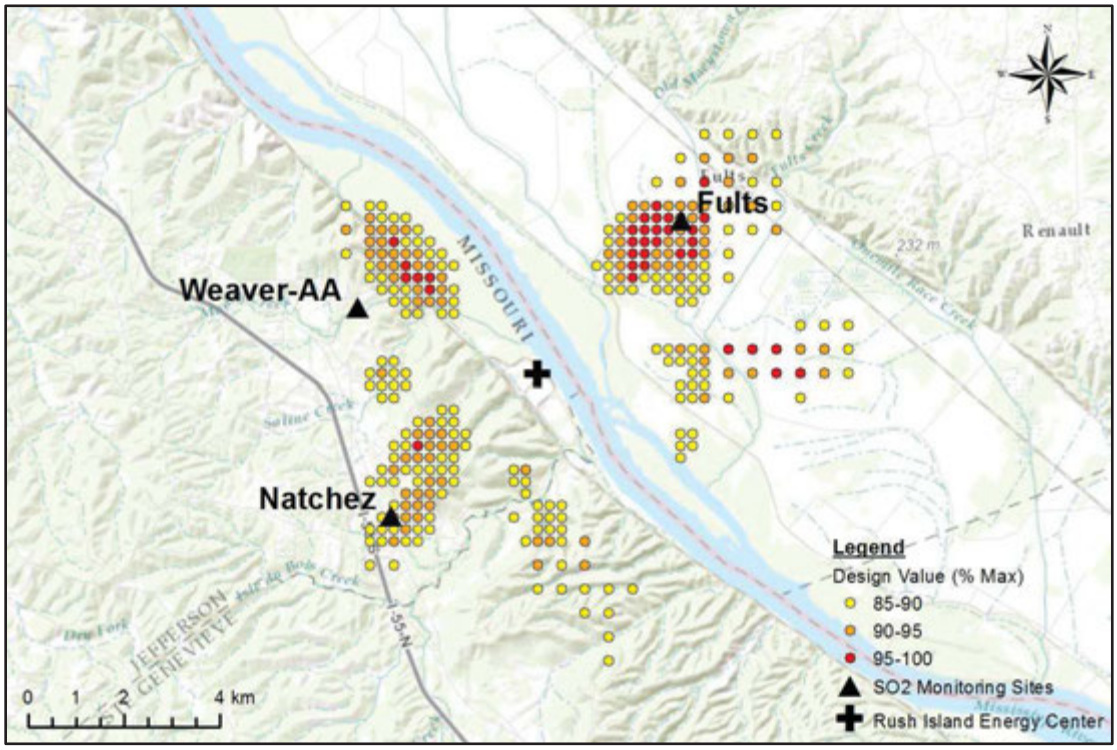

Figure 12. Top 300 receptors per DNR's original modeling.

[19] DNR used actual rather than normalized design values, but that does not affect the outcome of the analysis.

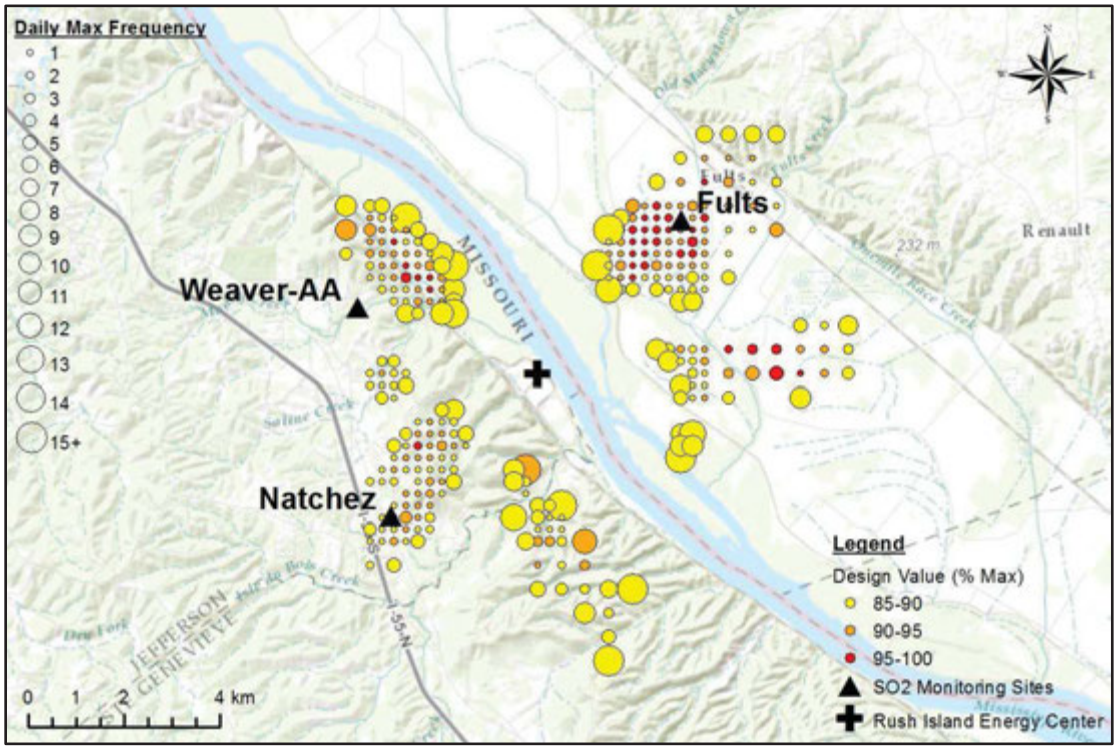

Figure 13. Frequency of having the 1-hour daily maximum concentration.

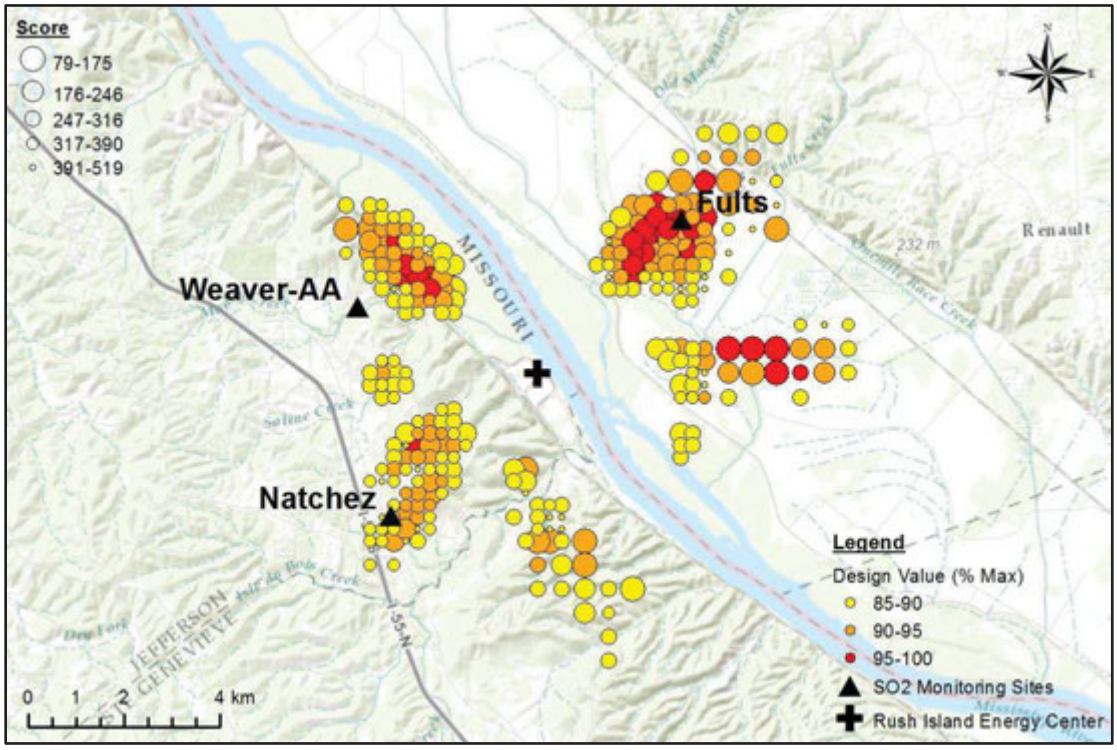

Figure 14. Receptor scores (concentration rank + day rank).

At this point, however, DNR abandoned the scoring strategy described in the Monitoring TAD. Instead of performing the final step and ranking receptors by their scores in order to provide a list of locations ranked in general order of desirability with regard to permanent monitor siting, it reverted to the flawed methodology used in its original analysis and counted the number of top receptors within five numbered polygons arrayed around the plant. These polygons are shown in Figure 15. It then ranked the polygons by the number of top receptors within each one and concluded, based on the fact that polygons 1, 2, and 3, where DNR Figures S-2 and S-3 show the monitors are located, contain the most top receptors, that the supplemental analysis supports its earlier conclusion that the siting of the monitors is reasonable.

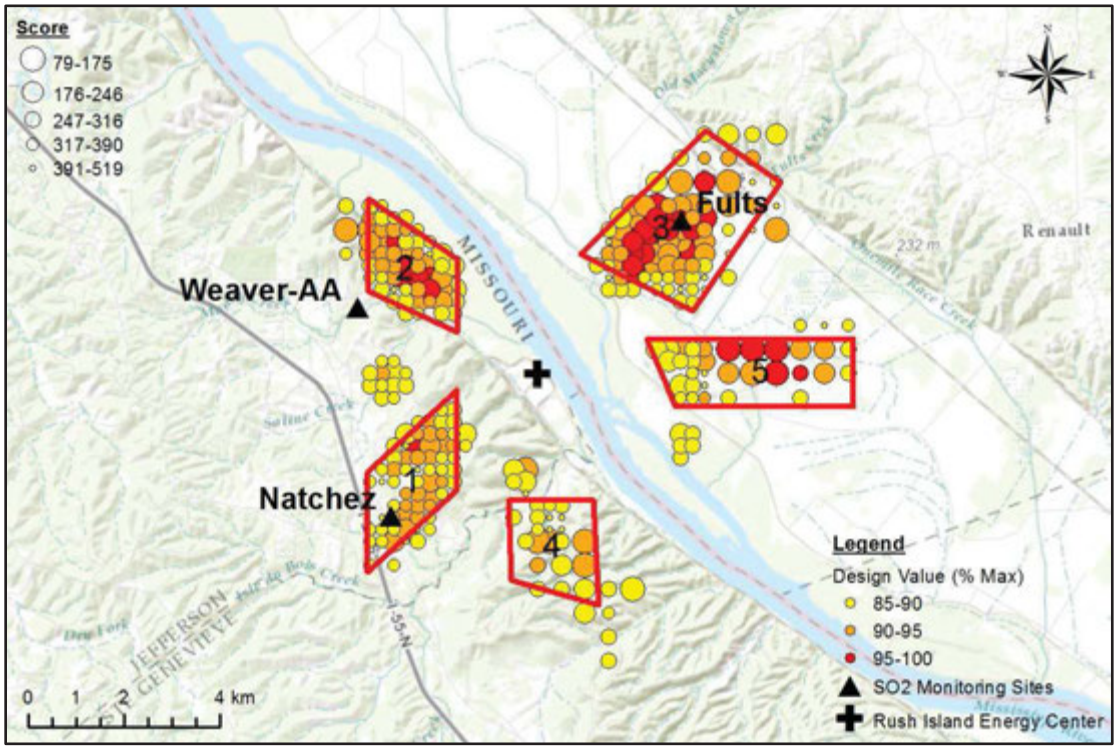

Figure 15. Polygons used in DNR's supplemental analysis.

There are several problems with this analysis:

1) DNR's use of a telescoping receptor grid results in biased counts of the number of receptors within each of the five polygons because the polygons are located in a region where the receptor spacing varies. As a result, some of the polygons contain more receptors than others simply because the receptors in those polygons are spaced more closely together.
2) The polygons used in DNR's supplemental analysis are a different size and shape than the ones used in its original analysis. This is shown in Figure 16. Setting aside the bias inherent in DNR's methodology owing to its use of a telescoping receptor grid, the supplemental analysis should use the same polygons as the original analysis if polygon rankings based on receptor counts are going to be compared.
3) The Weaver-AA monitoring site is located outside of polygon 2, so even if DNR's original conclusion that monitors placed in polygons 1, 2, and 3 are "the best options to

represent Rush Island Energy Center's air quality impacts" were supported by its supplemental analysis, the Weaver-AA monitor still would not be properly sited.

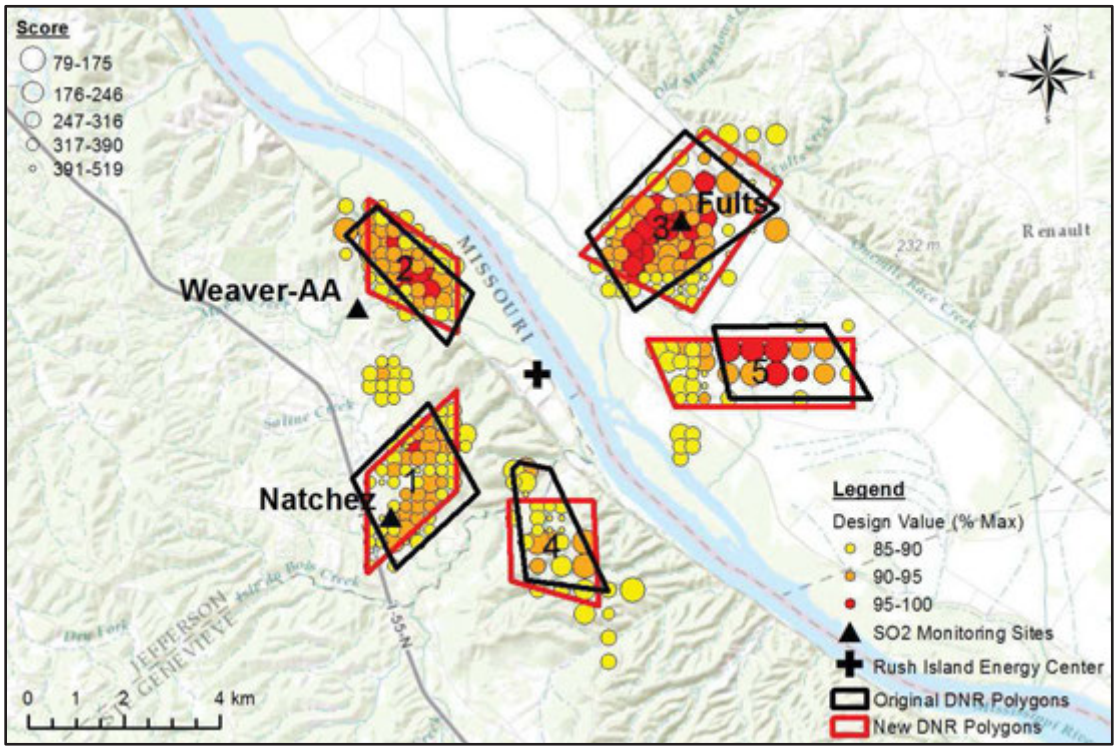

Figure 16. Comparison of polygons used in DNR's original and supplemental analyses.

The most serious problem with DNR's supplemental analysis, though, is that given the methodology used, it fails to fulfill its purported purpose, which is to also "account for the frequency with which a receptor registers a daily maximum concentration."[20] Accordingly, DNR's supplemental analysis provides no new information about whether the Rush Island SO_2 monitors are properly sited.

DNR performed the modeling necessary to determine the frequency with which a receptor registers a daily maximum concentration. It then calculated receptor scores, which account for this frequency as well as modeled design value. However, those scores did not have any bearing on the outcome of DNR's analysis because DNR ultimately ignored them and based its conclusions solely on the number of top receptors (i.e., those with the highest design values) in each of the five polygons shown in Figure 15. DNR did break out the number of top receptors in each polygon by score in Table S-1, listing the number of receptors in each of five scoring ranges, but it used *total* receptor counts to rank the polygons. Hence, receptor scores did not factor into the polygon ranks at all.

It is no surprise, then, that DNR's supplemental analysis supports the conclusions of its original analysis as they are, in fact, identical in that both base their conclusions solely on modeled design values. The supplemental analysis is just limited to the top 300 receptors, which has no

[20] 2016 Monitoring Network Plan, Appendix 2 at 2.

effect on the results because the high-concentration receptors DNR based its polygon rankings on originally were all top 300 receptors as well.

VI. A Supplemental Analysis Properly Conducted Pursuant To EPA's Monitoring TAD Demonstrates that the Natchez and Weaver-AA Monitors Are Not Properly Sited.

Had DNR followed the scoring strategy described in the TAD through to the end, and ranked receptors by their scores to come up with a list of locations ranked in general order of desirability with regard to monitor siting, its supplemental analysis would have reached a different conclusion regarding the siting of the Rush Island monitors. Figure 17 shows the 10, 25, 50, and 100 receptors with the highest score ranks superimposed on the peak concentration areas (design value >90 ug/m^3). The 10 receptors with the highest score ranks would be the most desirable monitor locations, and all but one are clustered in the three largest peak concentration areas, which are where the Rush Island SO_2 monitors should have been sited. The fact that almost all of the 10 highest ranked receptors – taking into account modeled design values *and* frequency of having the highest 1-hour daily maximum concentration – are located in these areas only reinforces that point. Similar results are obtained by looking further down the priority list at the 25, 50, and 100 highest ranked receptors, the vast majority of which are located in the same three peak concentration areas.

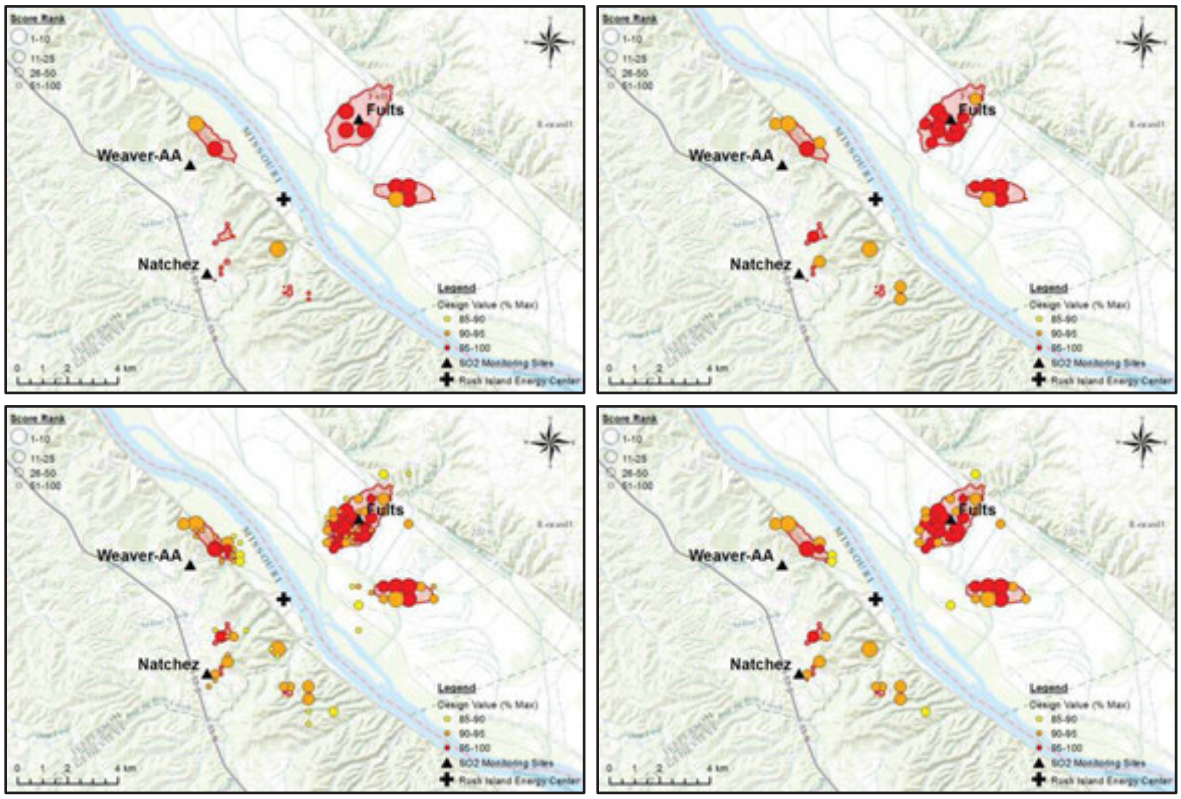

Figure 17. Receptors with the 10, 25, 50, and 100 highest score ranks (clockwise from upper left). Peak concentration areas (design value >90 ug/m^3) are shaded red.

Only one of the three Rush Island monitors is sited in these peak concentration areas. The Fults monitor is sited in the large peak concentration area located northeast of the plant, which contains three of the 10 highest ranked receptors and upwards of half of the 100 highest ranked receptors. The Natchez and Weaver-AA monitors, however, are located outside of the large peak concentration areas east and northwest of the plant, which collectively contain six of the 10 highest ranked receptors about 25 of the 100 highest ranked receptors. DNR should require Ameren to relocate the Natchez and Weaver-AA monitors to these areas, as they clearly represent – along with the area where the Fults monitor is located – the areas where peak concentrations are expected to occur based on DNR's own modeling and the receptor scoring strategy described in the TAD.

VII. Modeling Based On Updated Emissions And Meteorological Data Calls For At Least One Additional Monitor At Rush Island.

DNR used 2011-2013 emissions data in its analyses of the Rush Island monitoring sites. However, Rush Island's emissions profile has changed in recent years due to Ameren's switch to ultra-low sulfur coal at all of its un-scrubbed plants (Labadie, Meramec, and Rush Island). In recent comments to EPA on the agency's proposed nonattainment designation for Labadie, Ameren said the following regarding modeling of the plant's emissions: "[I]n 2011, Ameren entered into a long-term contract for the use of ultra-low sulfur coal at Labadie. Ameren began burning significant quantities of ultra-low sulfur coal in *2013*, and intends to continue to do so in the future ... Therefore, modeling that relies on emissions data from 2013 forward is far more representative of actual conditions at Labadie than pre-2013 data."[21] Given that Ameren is also burning ultra-low sulfur coal at Rush Island, data from 2013 forward should also be more representative of current conditions at Rush Island.[22] DNR's supplemental analysis did not evaluate the effect of using updated (2013-2015) emissions on the location of the Rush Island monitoring sites.

Updating DNR's modeling to use 2013-2015 emissions and meteorological data results in markedly different results from those obtained using 2011-2013 data. Figure 18 shows the 300 receptors with the highest modeled design values when 2013-2015 data are used; Figure 19 shows the frequency of having the highest 1-hour daily maximum concentration among these receptors; and Figure 20 shows their scores, which were calculated by adding their respective concentration ranks and day ranks per the scoring strategy described in the TAD.

[21] Ameren Missouri, Comments on EPA Responses to Certain State Designation Recommendations for the 2010 Sulfur Dioxide National Ambient Air Quality Standard: Notice of Availability and Public Comment Period (March 31, 2016) at 35.

[22] It is not clear whether current conditions are representative of future conditions, however, because Ameren's five-year contract for ultra-low sulfur coal will expire in 2017 and the provider of the coal, Peabody Energy, is now in bankruptcy and the nature and extent of its future operations is uncertain.

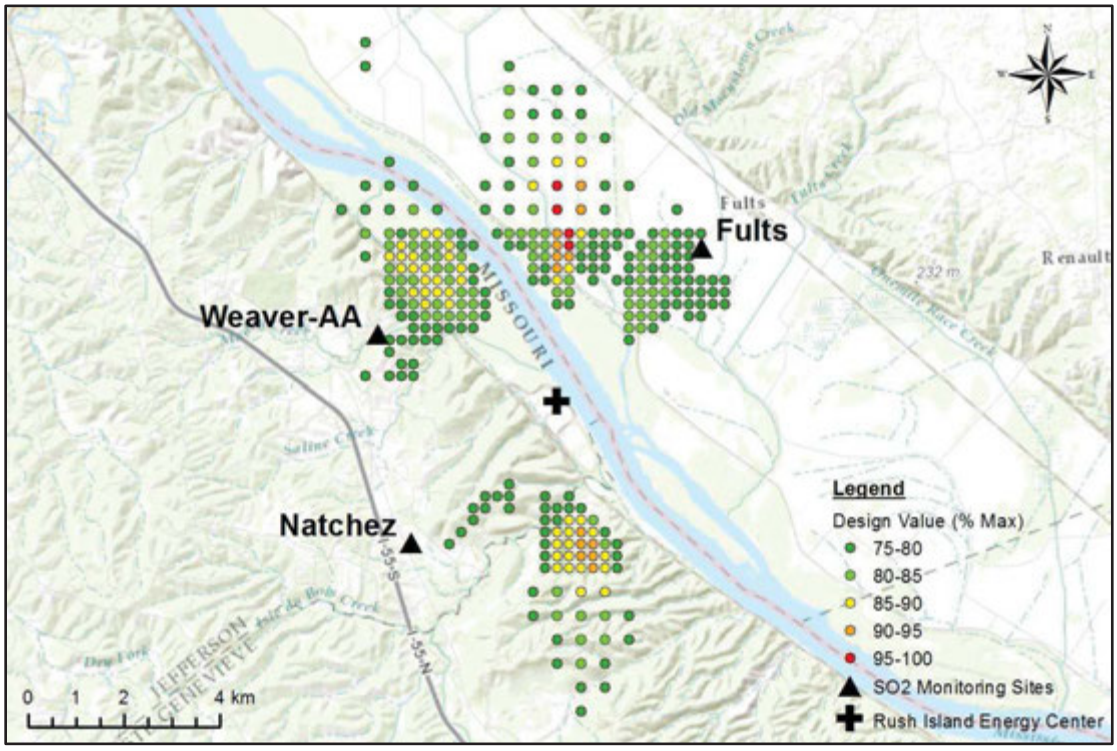

Figure 18. Top 300 receptors based on 2013-2015 data.

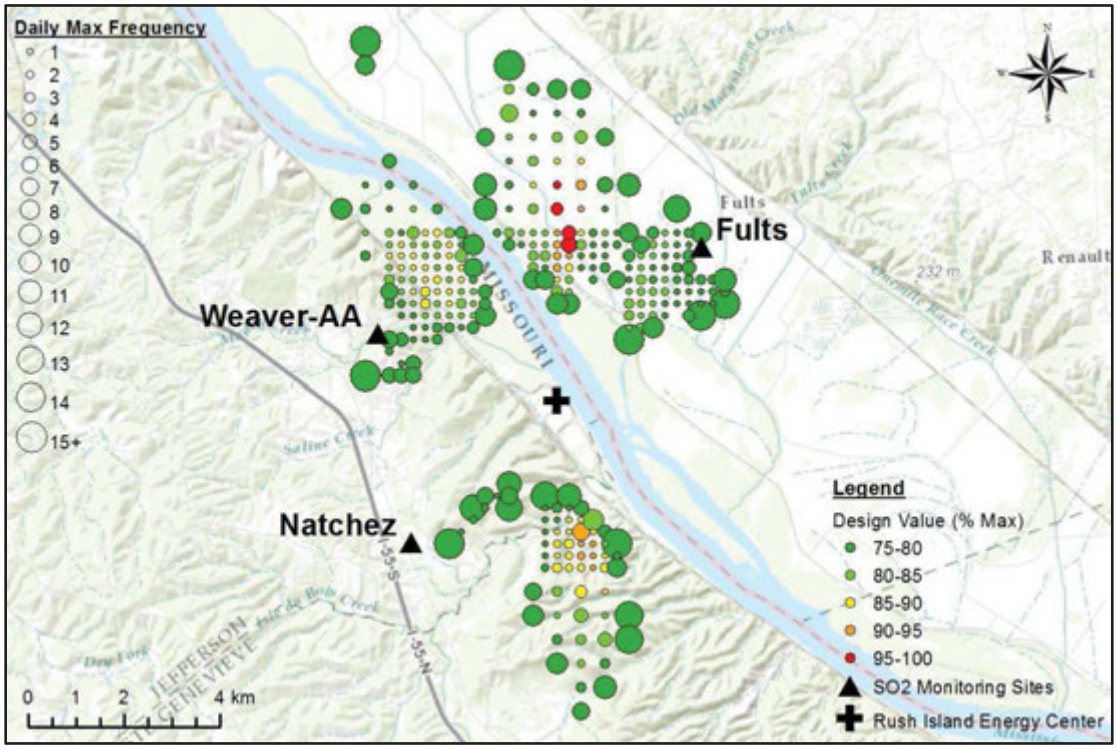

Figure 19. Frequency of having the 1-hour daily maximum concentration based on 2013-2015 data.

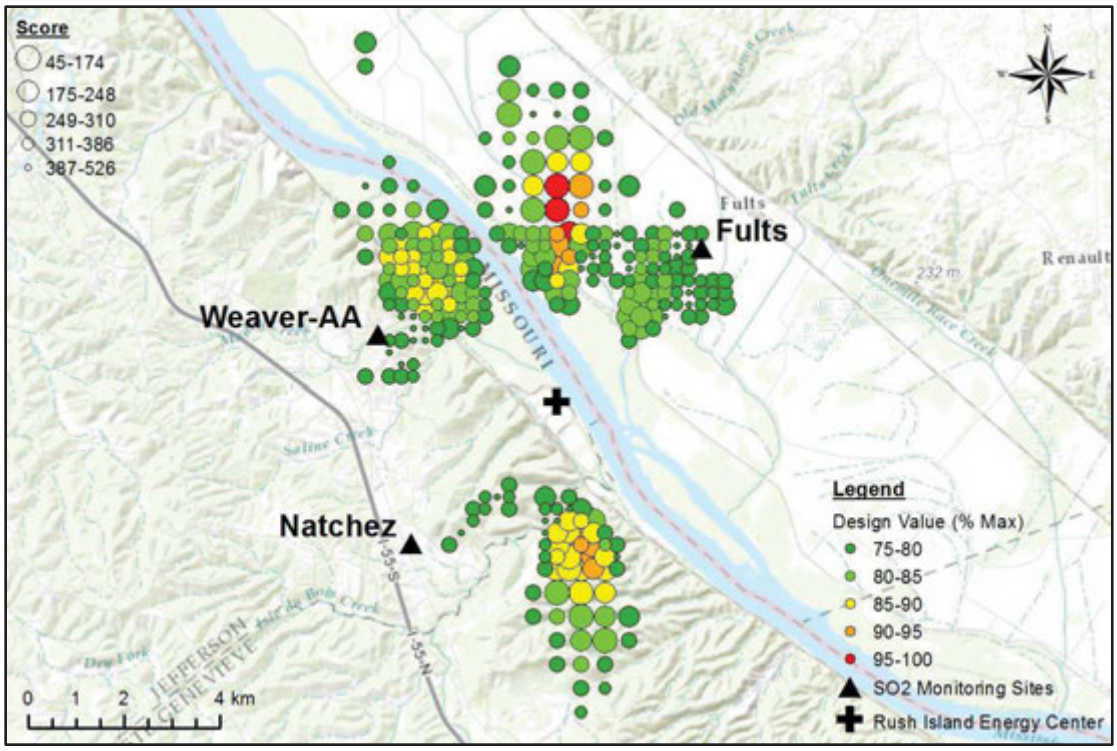

Figure 20. Receptor scores (concentration rank + day rank) based on 2013-2015 data.

When 2013-2015 data are used, the highest concentration areas shift and are located immediately north and south of the plant instead of to the east, northeast, and northwest, as shown in Figure 18. The receptors with the lowest scores – i.e., those with the highest combined concentration rank (based on modeled design value) and day rank (based on frequency of having the highest 1-hour daily maximum concentration) – are similarly located north and south of the plant, as shown in Figure 20. Furthermore, when the top receptors are ranked by score so as to provide a list ranked in general order of desirability with regard to siting monitors in accordance with the Monitoring TAD, there are no high-ranking receptors near any of the existing monitors. Figure 21 shows the 10, 25, 50, and 100 receptors with the highest score ranks based on modeling using 2013-2015 data.

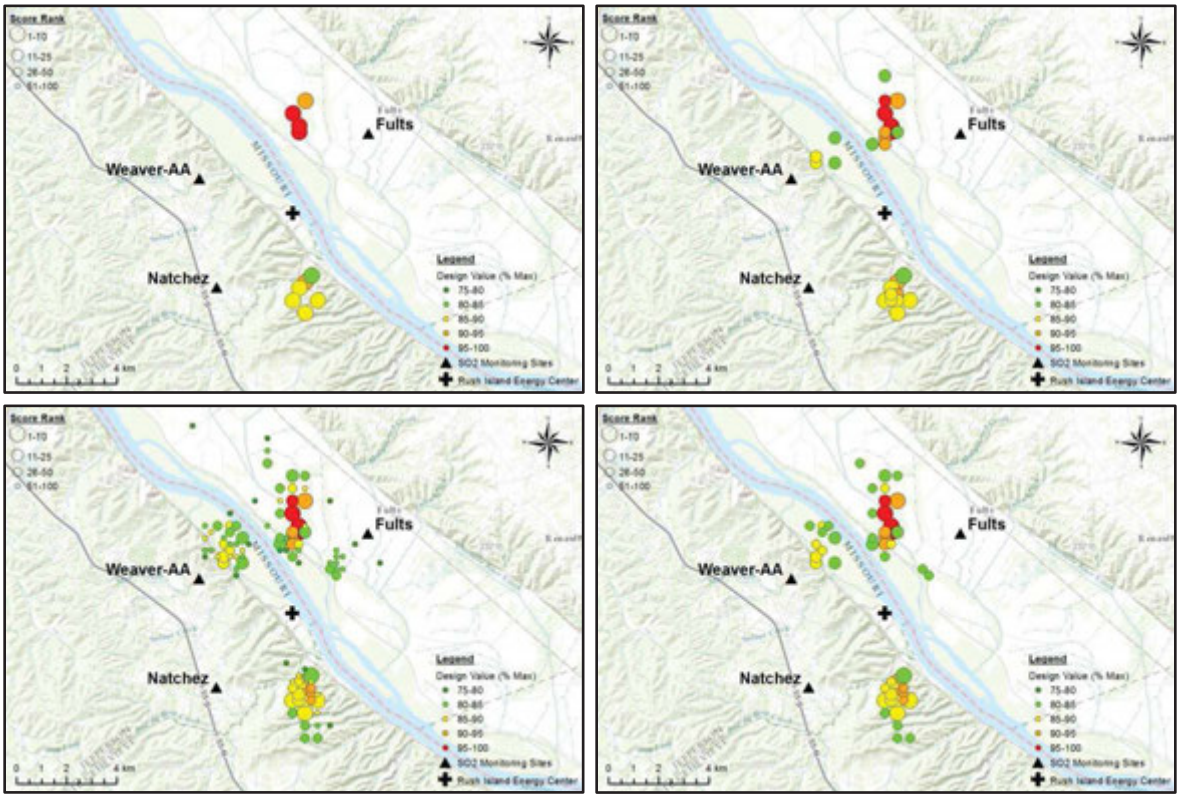

Figure 21. Receptors with the 10, 25, 50, and 100 highest score ranks (clockwise from upper left) based on 2013-2015 data

The significant difference in modeled peak concentration areas when 2013-2015 data are used in lieu of 2011-2013 data demonstrates one of the major drawbacks (besides providing data at only a limited number of discrete points) of using monitoring as a means of determining NAAQS compliance. As emissions and meteorological conditions change over time, peak concentration areas can shift, leaving monitors that may have been properly sited at one time in areas that are no longer appropriate. For example, the Fults monitor is appropriately sited based on modeling using 2011-2013 data but is not in a peak concentration area at all – let alone at a high priority location based on the scoring strategy described in the TAD – based on modeling using 2013-2015 data. This points to the need for additional monitors at Rush Island to ensure that the network is capable of adequately characterizing peak concentrations around the plant, which could easily shift again in the future. In addition to requiring relocation of the Natchez and Weaver-AA monitors to peak concentration areas as discussed above, DNR should require the addition of monitors immediately north and south of the plant, in peak concentration areas based on modeling using 2013-2015 data.

Conclusion

Ameren's Labadie and Rush Island power plants are the two largest sources of sulfur dioxide emissions in the State. While virtually all other plants of their size across the nation have already adopted or made binding commitments to adopt scrubber technology to dramatically reduce their sulfur dioxide emissions, Ameren instead has installed monitors designed not to capture peak

SO_2 concentrations around these two plants. Sierra Club urges DNR to require Ameren to relocate the existing monitors (except for the Northwest monitor at Labadie and the Fults monitor at Rush Island) and expand the monitoring networks at both plants as described above. Sierra Club also urges EPA to make clear to DNR that the existing monitoring networks at the Labadie and Rush Island plants do not satisfy the criteria for SLAMS monitors for source-oriented ambient SO_2 monitoring purposes and that data from the monitors will not be used for regulatory decision-making.

Sincerely yours,

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Cc: Rebecca Weber, Director, Air & Waste Management Division, EPA Region 7
Michael Jay, Chief, Air Planning & Development Branch, EPA Region 7
Kyra Moore, Director, Air Pollution Control Program, DNR
Darcy Bybee, Chief, Air Quality Planning Section, Air Pollution Control Program, DNR

December 15, 2016

Ms. Kyra Moore, Director
Air Pollution Control Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Re: Ameren's Comments on the MDNR 2016 Monitoring Network Plan Update

Dear Ms. Moore:

On behalf of Ameren Missouri, we appreciate this opportunity to comment on the "Missouri Department of Natural Resources, Air Pollution Control Program, 2016 Monitoring Network Plan, Revision 1" (updated monitoring plan). As noted in the updated monitoring plan, two additional monitors have been added to the existing monitoring network for the Labadie Energy Center.

Ameren offers these comments on the updated monitoring plan. Ameren fully supports the inclusion of the two additional sulfur dioxide (SO2) monitoring locations to enhance the already robust monitoring network for the Labadie Energy Center. Ameren is committed to operate and maintain the enhanced monitoring networks consistent with requirements in federal regulation 40 CFR 58 as well as the state approved Quality Assurance Project Plans (QAPP) and the Department's Quality Management Plan (QMP). As indicated by the inclusion of the Labadie and Rush Island monitoring networks in the 2015 monitoring plan, the locations of the monitors are appropriate to determine compliance with the National Ambient Air Quality Standard (NAAQS) for SO2. The monitoring plan states on page 7 that: "For decades Missouri has overseen ambient air monitoring sites operated by industrial sources for NAAQS compliance." The Department has decided to classify both the Labadie and Rush Island SO2 monitors as industrial SO2 monitors and affirms on page 18 of the updated monitoring plan that "this is consistent with how we have handled industrial monitors used for NAAQS compliance in both our SO2 and lead ambient monitoring networks."

As you know the primary purpose of the Labadie monitoring network is to demonstrate compliance with the SO2 NAAQS. The monitoring network was in operation well in advance of the January 1, 2017 deadline under the final Data Requirements Rule (DRR). Both the existing and the enhanced monitoring networks are designed consistent with the requirement of the DRR.

Ameren would especially like to note that the one-hour SO2 ambient concentration data collected to date at each network are all below the SO2 NAAQS and have demonstrated a very high margin of compliance with the SO2 NAAQS.

Please contact me at your convenience if you have questions related to these comments or if you need any additional information.

Sincerely,

Steven C. Whitworth
Senior Director, Environmental Policy and Analysis