Missouri Department of Natural Resources
Air Pollution Control Program
2020 Monitoring Network Plan

September 25, 2020

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Summary of Recent and Proposed Changes

The Missouri Department of Natural Resources operates an extensive network of ambient air monitors. Missouri's Monitoring Network Plan summarizes the network and discusses recent and proposed changes. The changes are summarized below.

1. Effective Jan. 1, 2020, Doe Run made the following changes in its Herculaneum monitoring network: sampling frequency at North Cross was reduced to every third day, collocated monitoring at Church Street was discontinued and monitoring at Sherman was discontinued. These changes do not require Department or EPA approval since these monitors are not required in 40 CFR 58 or in any formal agreements. The Department informed EPA Region 7 of these changes on Sept. 30, 2019.

2. Doe Run monitoring activities are currently designated as three separate primary quality assurance organizations (PQAO): Doe Run Buick, 1288; Doe Run Glover, 1289; and Doe Run Herculaneum, 1290. The Department proposes to combine these into a single PQAO (1290) effective Jan. 1, 2021. The three Doe Run networks are all using the same analytical laboratory for lead analysis and the same contractor for assistance in developing Quality Assurance Project Plans (QAPPs) and providing Quality Assurance (QA) audits.

3. The Department has begun the process of obtaining retrofits of the 1405-DF instruments at $PM_{2.5}$ monitoring sites to 1405-Fs. As of June 2020, the Department is operating 1405-F instruments at six sites. We plan to convert two additional sites (St. Joseph; two monitors and Richards Gebaur South) to 1405-F operation in 2021, subject to the availability of funds.

4. The West Alton ozone monitoring site was inoperative from May 2 to 16 and May 22 to July 16, 2019, because it was removed to avoid damage due to flooding. Because of its importance as the design value site for the St. Louis area, the Department is developing a cost estimate and plan for elevation of the West Alton monitoring site above the 2019 high water level to minimize outages related to flooding in the future. Any changes will still meet probe height requirements.

5. A Photochemical Assessment Monitoring Station (PAMS) Implementation Plan, updated from the versions included in the 2018 and 2019 Monitoring Network Plans, is included as Section 9 of this plan. PAMS monitoring is planned to begin at the Blair Street site on June 1, 2021.

How to Make Public Comments Concerning this Plan

The Department of Natural Resources posted the 2020 Monitoring Network Plan (Revision 0) on the web for public review and comment on July 15, 2020. The Department accepted comments concerning the plan electronically at cleanair@dnr.mo.gov, or by mail to the following address:

Missouri Department of Natural Resources
Air Pollution Control Program
Air Quality Analysis Section/Air Monitoring Unit
P.O. Box 176
Jefferson City MO 65102

The Department has included all comments received through August 14, 2020 and responses to comments in Appendix 2 of this final version of the plan. Minor corrections to the plan are also identified in Appendix 2.

Introduction

The Missouri Department of Natural Resources operates an extensive network of ambient air monitors to comply with the Clean Air Act and its amendments. The Ambient Air Quality Monitoring Network for Missouri includes State and Local Air Monitoring Stations (SLAMS), Special Purpose Monitors (SPM) and a National Core (NCore) monitoring site consistent with requirements in federal regulation in Title 40, Code of Federal Regulations, Part 58 (40 CFR 58).

40 CFR 58.10 requires states to submit an annual monitoring network plan including any proposed network changes to EPA. 40 CFR 58.10 requires the plan to include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D and E of 40 CFR 58 where applicable. All of the monitors in the Missouri air monitoring network, including those operated by the State and those operated by industries under state review meet the applicable requirements of 40 CFR 58. Any changes to the SLAMS requires approval by the EPA Regional Administrator.

The plan must contain the following information for each monitoring station in the network; (See Appendix 1 and the body of this document):

1. The Air Quality System (AQS) site identification number for existing stations.
2. The location, including the street address and geographical coordinates, for each monitoring station.
3. The sampling and analysis method used for each measured parameter.
4. The operating schedule for each monitor.
5. Any proposal to remove or move a monitoring station within a period of 18 months following the plan submittal.
6. The monitoring objective and spatial scale of representativeness for each monitor.
7. The identification of any sites that are or are not suitable for comparison against the annual $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS).

8. The metropolitan statistical area, core-based statistical area, combined statistical area or other area represented by the monitor.

A network assessment is required every five years, and the most recent one was completed in June 2020.

Network Design

Federal regulation (40 CFR Part 58) establishes the design criteria for the ambient air monitoring network. The network is designed to meet three general objectives:

1. Provide air pollution data to the public in a timely manner.
2. Support compliance with ambient air quality standards and emissions strategy development.
3. Support air pollution research studies.

Specific objectives for the monitoring sites are:

1. To determine the highest pollution concentrations in an area.
2. Measure typical concentrations in areas of high population density.
3. Determine the impact of significant sources or source categories.
4. Determine general background levels.
5. Determine the extent of regional pollutant transport among populated areas.

Minimum site requirements, based on Core Based Statistical Area (CBSA) population, are provided for ozone (O_3), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), airborne particulate matter with aerodynamic diameter equal to or smaller than 10 micrometers (PM_{10}), and airborne particulate matter with aerodynamic diameter equal to or smaller than 2.5 micrometers ($PM_{2.5}$).

40 CFR 58 Appendix E establishes the specific requirements for monitor/probe siting to ensure the ambient data represents the stated objectives and spatial scale. The requirements are pollutant/scale specific. Periodically, Department staff visit and evaluate each monitoring site to ensure compliance with the requirements of 40 CFR 58 Appendix E. Additional details concerning the sites are available in Appendix 1.

Unanticipated Network Modifications

Changes to the monitoring network may occur outside the annual monitoring network planning process due to unforeseen circumstances including, but not limited to, severe weather, natural events, changes in property ownership, changes in federal funding, or changes in funding available from air emission fees from industrial facilities. The Department will communicate any changes to the network that result from conditions outside the state's logistical control and not included in the current monitoring network plan to EPA Region 7 staff and identify such changes in the subsequent annual monitoring network plan.

Special Purpose Monitors

A monitor is designated as a special purpose monitor (SPM) consistent with the regulatory definition in 40 CFR 58.20 (a): "An SPM is defined as any monitor included in an agency's monitoring network that the agency has designated as a special purpose monitor in its annual monitoring network plan and in AQS, and which the agency does not count when showing compliance with the minimum requirements of this subpart for the number and siting of monitors of various types."

SPMs may be established for many different purposes, including but not limited to NAAQS compliance evaluation, air quality research and characterization, air quality investigation and monitoring method evaluation.

The Department includes SPMs in the annual monitoring network plan required by 40 CFR 58.10. The Department installs or approves the installation of these monitors consistent with 40 CFR 58.20 (f). In addition, the Department removes, or allows removal of these monitors, following federal guidelines, which are different for SPMs than for SLAMS. There is more description of each SPM later in the document. The Missouri Monitoring Network Description, Appendix 1, identifies which monitors are SPM and which are SLAMS.

Industrial Monitors

Ambient air monitoring sites classified as Industrial in this plan indicate the ambient air monitoring at that site is being conducted by the industrial source or its contractor under an approved industrial monitoring Quality Assurance Project Plan (QAPP) and departmental Quality Management Plan (QMP). Department staff conducts quality assurance audits of these monitoring sites consistent with the approved QAPP.

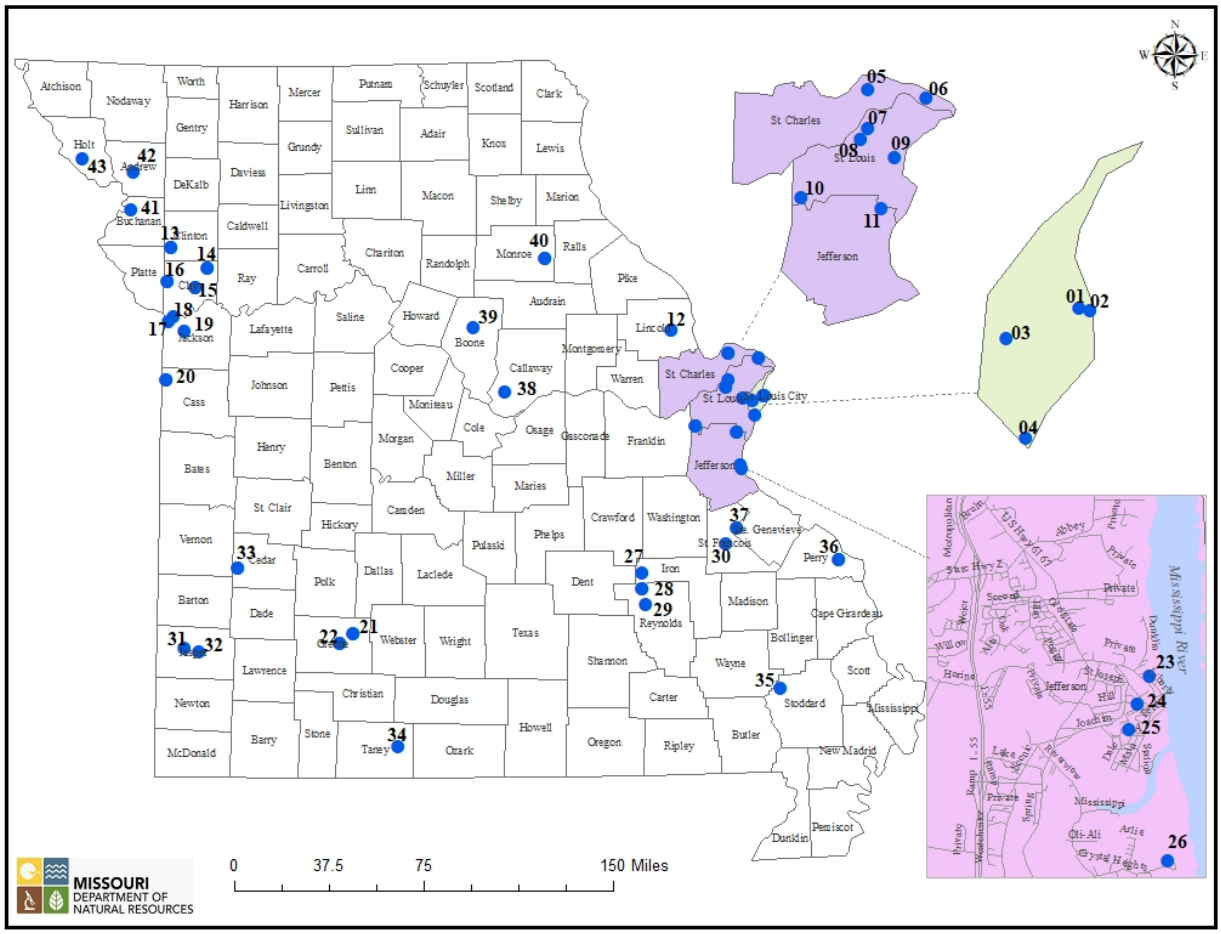
Missouri oversees ambient air monitoring sites operated by industrial sources for NAAQS compliance. The Department has incorporated these Industrial sites in the annual Monitoring Network Plans. Currently, some industrial monitoring sites for lead and SO_2 are incorporated in the ambient air monitoring network.

Some industrial lead monitoring sites are classified in AQS as non-regulatory due to the sites transitioning to non-ambient status. However, the Department has required continued monitoring at these locations in agreements with the industrial source for trends analysis or other purposes.

2020 Ambient Air Monitoring Network, State Sites

The 2020 statewide monitoring network is shown in the following map and table.

2020 Missouri State Monitoring Network



Legend (State's Monitoring Network)

St. Louis Area

Site#	Site Name	Parameter Monitored
01	Blair Street^	PM_{10}, $PM_{2.5}$, $PM_{2.5}$(Spec), PMCoarse, PM_{10}-LC, PM_{10}-Pb, O_3, SO_2, NO_2, NO_y, NOx, NO, CO, Carbonyls, PAHs, VOCs, Air Toxics, Carbons, PM_{10} Metals, WS, WD, OT, IT, SR, BP, RH, PAMS
02	Branch Street	PM_{10}, $PM_{2.5}$, WS, WD, OT, IT, BP, RH
03	Forest Park	$PM_{2.5}$, PMCoarse, PM_{10}-LC , NO_2, NOx, NO, CO, BC, WS, WD, OT, IT, SR, BP, RH, Prec
04	South Broadway	PM_{10}, $PM_{2.5}$, IT, BP, RH
05	Orchard Farm	O_3, IT
06	West Alton	O_3, WS, WD, OT, IT, SR
07	Rider Trail I-70	NO2, NOx, NO, WS, WD, OT, IT, SR, Prec, BP SO_2 (RES)
08	Maryland Heights	O_3, IT
09	Ladue	$PM_{2.5}$, OT, IT, BP, RH
10	Pacific	O_3, IT
11	Arnold West	PM_{10}, $PM_{2.5}$, $PM_{2.5}$(Spec), IT, O_3, WS, WD OT, IT, BP, RH
12	Foley West*	O_3, IT

Kansas City Area

Site#	Site Name	Parameter Monitored
13	Trimble	O_3, IT
14	Watkins Mill	O_3, IT
15	Liberty	$PM_{2.5}$, PM_{10}-LC, O_3, OT, IT, SR, BP, RH
16	Rocky Creek	O_3, IT
17	Troost	$PM_{2.5}$, SO_2, NO_2, NOx, OT, IT
18	Front Street	PM_{10}
19	Blue Ridge I-70	$PM_{2.5}$, PMCoarse, PM_{10}-LC, NO_2, NOx, NO, CO, BC, WS, WD, OT, IT, SR, BP, RH, Prec
20	Richards Gebaur-South	$PM_{2.5}$, PM_{10}-LC, O_3, WS, WD, OT, IT, BP, RH

Springfield Area

Site#	Site Name	Parameter Monitored
21	Fellows Lake	O_3, IT
22	Hillcrest High School	O_3, PM_{10}, $PM_{2.5}$, PM_{10}-LC, OT, IT, BP, RH

Herculaneum Area

Site#	Site Name	Parameter Monitored
23	Sherman	Pb
24	Dunklin High School	Pb
25	Mott Street	Pb, SO_2
26	Ursuline North	Pb

New Lead Belt Area

Site#	Site Name	Parameter Monitored
27	Buick NE	Pb, SO_2, WS, WD, IT
28	Oates	Pb
29	Fletcher	Pb
30	St. Joe State Park	Pb

Outstate Area

Site#	Site Name	Parameter Monitored
31	Alba	O_3, IT
32	Carthage	PM_{10}, WS, WD, IT
33	El Dorado Springs	$PM_{2.5}$, O_3, WS, WD, OT, IT, BP, RH
34	Hercules Glades	$PM_{2.5}$ (Spec)-IMPROVE
35	Mingo	$PM_{2.5}$ (Spec)-IMPROVE
36	Farrar	O_3, IT
37	Bonne Terre	O_3, IT, SR
38	New Bloomfield	O_3, IT
39	Finger Lakes	O_3, IT
40	Mark Twain State Park	PM_{10}, SO_2, NO_2, NOx, NO, O_3, WS, WD, IT
41	St. Joseph Pump Station	PM_{10}, $PM_{2.5}$, PM_{10}-LC, WS, WD, OT, IT, RH
42	Savannah	O_3, IT
43	Forest City, Exide	Pb

*Relocated from former Foley site
^PM_{10}-Pb at Blair is NAAQS excluded

Acronyms

PM_{10}	Particulate Matter (Diameter size ≤10 micrometer
$PM_{2.5}$	Particulate Matter (Diameter size ≤2.5 micrometer)
PMCoarse	Particulate Matter (Diameter size between 2.5 and 10 micrometer)
Spec	Speciation
SO_2	Sulfur Dioxide
NO_2	Nitrogen Dioxide
NO	Nitric Oxide
NOy	Reactive Oxides of Nitrogen
NOx	Oxides of Nitrogen
O_3	Ozone
CO	Carbon Monoxide
Pb	Lead (High Volume)
BC	Black Carbon
Prec	Precipitation
WS	Resultant Wind Speed
WD	Resultant Wind Direction
OT	Outside Temperature
IT	Inside Temperature
SR	Solar Radiation
BP	Barometric Pressure
RH	Relative Humidity
IMPROVE	Interagency Monitoring of Protected Visual Environment (Regional Haze)
RES	Research
PAMS	Photochemical Assessment Monitoring Station

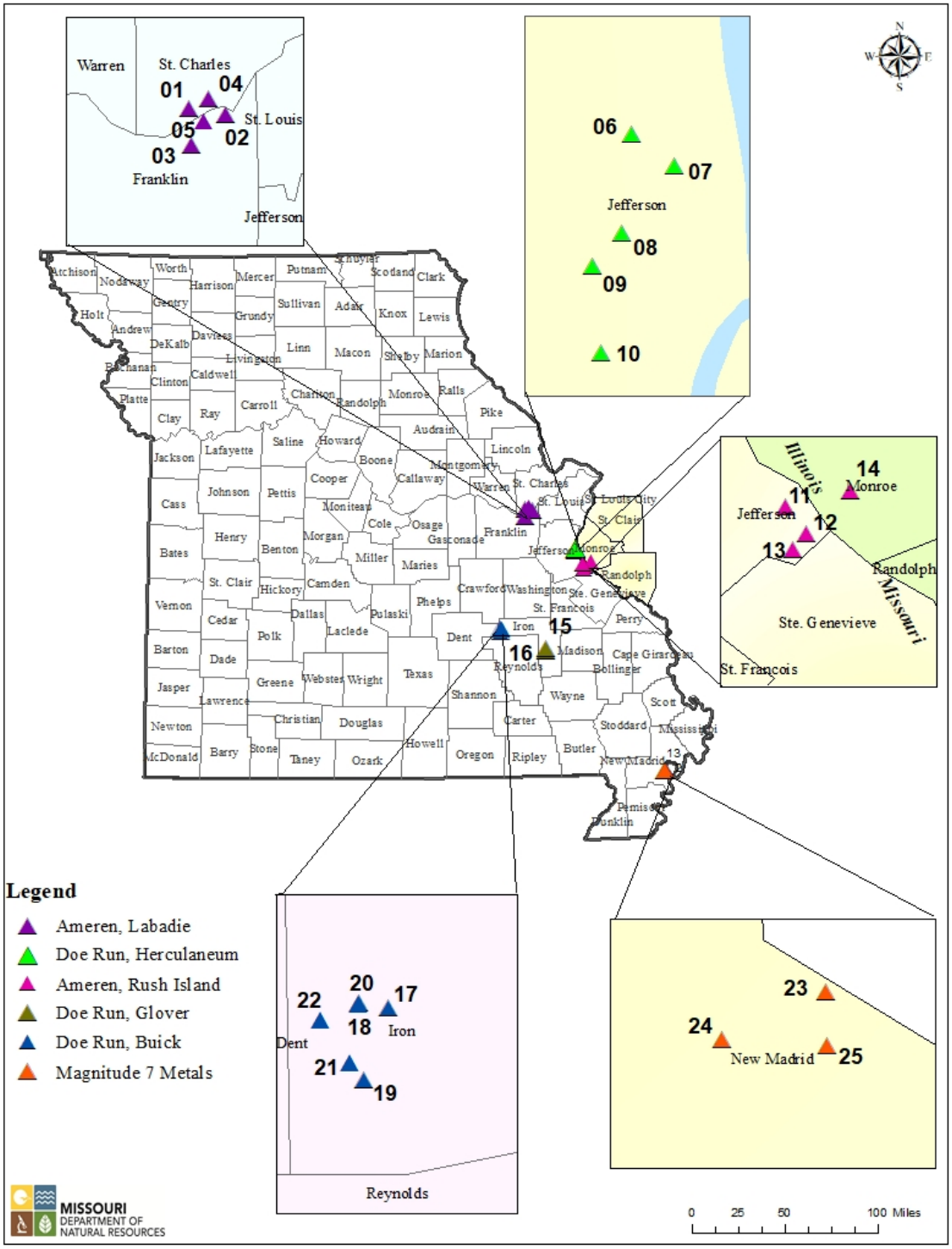
Notes:

1. The acronym $PM_{10\text{-}LC}$ is also commonly referred to as PM_{10c} when collected with a low volume sampler consistent with appendix O to Part 50. $PM_{10\text{-}LC}$ means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers where the concentration is reported at local conditions of ambient temperature and barometric pressure. $PM_{10\text{-}LC}$ is used in this document to describe any continuous or filter based PM_{10} low volume measurement concentration that is reported at local conditions of ambient temperature and barometric pressure.
2. PM_{10} means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers where the concentration is adjusted to EPA reference conditions of ambient temperature and barometric pressure (25 °C and 760 millimeters of mercury or STP).
3. PMCoarse is also frequently referred to as $PM_{10\text{-}2.5}$.

2020 Ambient Air Monitoring Network, Industrial Sites

Monitoring sites operated by industries are shown in the following map and listed in the following table.

2020 Missouri Industry Monitoring Networks



Legend (Industry Monitoring Network)

Ameren, Labadie Energy Center

Site#	Site Name	Parameter Monitored
01	Northwest	SO_2, (WS, VWS, WD, OT, σ_ϕ, σ_θ, RH)^
02	Valley	SO_2, (WS, VWS, WD, OT, SR, BP, RH, Prec, σ_ϕ, σ_θ)^
03	Southwest	SO_2
04	North	SO_2
05	Labadie Plant	SODAR (WS, WD, OT, σ_θ, σ_ϕ)^

Doe Run, Herculaneum

Site#	Site Name	Parameter Monitored
06	Dunklin	Pb
07	Broadway	(WS, WD, OT, SR, BP, RH, Prec, σ_θ)^[a]
08	Mott Street	Pb
09	North Cross	Pb
10	Church Street*	Pb

Ameren, Rush Island Energy Center

Site#	Site Name	Parameter Monitored
11	Weaver-AA	SO_2
12	Johnson Tall Tower	(WS, VWS, WD, OT, σ_ϕ, σ_θ)^
13	Natchez	SO_2
14	Fults, IL	SO_2, (WS, VWS, WD, OT, SR, BP, RH, Prec, σ_ϕ, σ_θ)^

Doe Run, Glover

Site#	Site Name	Parameter Monitored
15	Post Office #2*	Pb
16	Big Creek*	Pb

Doe Run, Buick

Site#	Site Name	Parameter Monitored
17	Buick NE	Pb
18	Buick North#5*	Pb
19	Buick South#1*	Pb, (WS, WD, OT, SR, BP, RH, Prec, σ_θ) ^[a]
20	Hwy 32 Northeast	SO_2
21	West Entrance	SO_2
22	County Road 75	SO_2

Magnitude 7 Metals

Site#	Site Name	Parameter Monitored
23	Site #1	SO_2
24	Site #2	SO_2
25	Site #3	SO_2, (WS, WD, OT)

Acronyms

SO_2	Sulfur Dioxide
Pb	Lead (High Volume)
σ_θ	Sigma Theta (Standard Deviation of Horizontal Wind Direction
WS	Resultant Wind Speed
WD	Resultant Wind Direction
OT	Outside Temperature
SR	Solar Radiation
BP	Barometer Pressure
RH	Relative Humidity
σ_ϕ	Sigma Theta (Standard Deviation of the Vertical Wind Speed)
Prec	Precipitation
VWS	Vertical Wind Speed

[a] Metrological Data is not submitted to the EPA Air Quality (AQS) Database

^ Regulatory Dispersion Modeling Grade Parameters

* Non-Ambient Monitor

Monitoring Network and Proposed Changes

1. Lead (Pb) Monitoring Network

Changes to airborne lead (Pb) requirements in 2010 require monitoring lead sources emitting 0.50 tons per year (tpy) or more, revised from the previous requirement for monitoring sources emitting one ton per year or more. (All airports in Missouri are exempt from this requirement.) Review of current 2018 emission data did not identify any new sources emitting greater than 0.50 tpy. The Department will continue to review emission data for new sources in the future.

1.1 Doe Run Operated Sites

Doe Run operates lead monitoring sites in the vicinity of its industrial facilities in Herculaneum, Glover and Boss. Operation of some of these sites is required by consent judgments or agreements with the Department, and operation of other sites is voluntary.

Doe Run Herculaneum also operates one 10 meter tower meteorological monitoring site as per language set forth under the 2011 Consent Judgment. Doe Run Herculaneum discontinued the 40 meter tower at Broad Street as per the Consent Judgment.

Effective Jan. 1, 2020, Doe Run made the following changes in its Herculaneum monitoring network: sampling frequency at North Cross was reduced to every third day, collocated monitoring at Church Street was discontinued, and monitoring at Sherman was discontinued. We believe that these changes do not require Department or EPA approval, and the Department informed EPA Region 7 of these changes on Sept. 30, 2019.

Doe Run monitoring activities are currently designated as three separate Primary Quality Assurance Organizations (PQAO): Doe Run Buick, 1288; Doe Run Glover, 1289; and Doe Run Herculaneum, 1290. The Department proposes to combine these into a single PQAO (1290) effective Jan. 1, 2021. Department staff informed EPA Region 7 staff of this proposed change by email in March 2020, and EPA staff requested by email in April 2020 that the proposed change be included in this Monitoring Network Plan. The three Doe Run networks are all using the same analytical laboratory for lead analysis and the same contractor for assistance in developing QAPPs and providing QA audits. Consolidation would improve efficiency and cost-effectiveness for the Missouri-implemented federally-equivalent performance evaluation program (PEP) audits for lead.

The justification for this consolidation is based on EPA's definition and description of a PQAO found in 40 CFR Part 58 Appendix A Section 1.2 and on the October 2015 EPA Office of Air Quality Planning and Standards (OAQPS) technical memorandum regarding consolidation of industrial PQAOs for monitoring under the SO_2 Data Requirements Rule (DRR). The DRR memorandum provides clarification of the EPA OAQPS position on industrial networks submitting data to AQS for NAAQS determinations. In general, OAQPS has indicated that it prefers consolidation of PQAOs in most cases.

The three industrial monitoring organizations share the same overall corporate management structure (The Doe Run Company) although they are associated with three separate facilities that are geographically distant from each other. All three organizations are monitoring for lead under AQS Parameter code 14129 and reporting data to AQS in the same units. For this consolidation proposal, Missouri has a precedent set with Ameren Missouri with the classification of two-separate source-oriented industrial networks under the same corporate structure merged into one PQAO. 40 CFR 58 Appendix A defines a PQAO as a monitoring organization or a group of monitoring organizations that is responsible for a set of stations that monitors the same pollutant and for which data quality assessments will be [likely] pooled. Since data quality assessments are made and data certified at the PQAO level, the monitoring organization identified as the PQAO is responsible for the oversight of the quality of data of all monitoring organizations within the PQAO. Each PQAO shall be defined such that measurement uncertainty among all stations in the organization can be expected to be reasonably homogeneous as a result of common factors. EPA defines common factors that should be considered in defining PQAOs to include:

(a) Operation by a common team of field operators according to a common set of procedures.
(b) Use of a common QAPP or Standard Operating Procedures (SOP).
(c) Common calibration facilities and standards.
(d) Oversight by a common quality assurance organization.
(e) Support by a common management organization (i.e., state agency) or laboratory.

Application of each of these factors to Doe Run air monitoring is discussed below:

(a) Operation by a common team of field operators is unlikely when different organizations are merged that are geographically separated. This would seem to be a barrier to consolidation. However, the 2015 DRR memo appears to deemphasize this component, especially when it involves industrial monitoring organizations and oversight by State agencies. EPA OAQPS has expressed that it supports PQAO consolidation and increased oversight by State agencies for NAAQS projects. In the DRR memo, OAQPS even made the argument that industrial organizations could be combined into the State PQAO despite not sharing a common group of site operators. Missouri's involved approach to industrial monitoring networks results in ensuring consistency of procedures and data measurement quality requirements. This approach ensures industry network procedures are consistent with each other and with state-operated sampling procedures.

    The three Doe Run networks currently operate under separate QAPPs and SOPs. The Department assists the industry operators in developing these documents. Each organization has a separate QAPP, but they are virtually identical in the Data Quality Objectives (DQOs) and Measurement Quality Objectives (MQOs). The Department takes responsibility for all quality system documentation for all industry-operated air monitoring projects in the state. All Doe Run QAPPs are subject to review and approval by the State agency prior to monitoring. For all industry NAAQS monitoring projects, Missouri oversight includes review and approval of all QAPPs and SOPs. This process ensures each project quality system and standard operating procedures are consistent with procedures employed by the Missouri State monitoring network. Each industry QAPP

specifies full compliance with the requirements contained in 40 CFR 58 Appendix A and also requires compliance with the data validation criteria tables for Pb-TSP contained in the 2017 EPA QA Handbook (document EPA-454/B-17-001). The three QAPPs are virtually the same for sampling methods, analysis methods, and requirements for the data. In addition, the Department uses a template to standardize the industry project QAPP formats. Doe Run has also relied on the same professional contract organization to prepare the QAPPs and SOPs for submittal to the Department. All three organizations are subject to the Missouri Quality Management Plan (QMP) approved by EPA Region 7.

(b) For lead sampling, the calibration reference standards consist of a high-volume flow rate measurement system that includes sensors to measure ambient temperature and barometric pressure. All three Doe Run monitoring organizations rely primarily on Tisch Environmental Inc. for annual flow device certifications. Tisch is a manufacturer and primary supplier of high-volume air sampling equipment. All three organizations use reputable vendors to recertify temperature and pressure measurement sensors. All three organizations rely on internal network audits from a professional monitoring and auditing organization, Inquest Environmental. The internal audits serve to verify the accuracy and consistency of flow rate measurement standards. The Missouri Department of Natural Resources quality assurance laboratory is also available for certifications or verifications of measurement systems.

(c) For all industrial source-oriented PQAOs, Missouri establishes QA independence, wherein the State agency functions as the independent QA management organization. All three Doe Run facility monitoring operations are served by the Department's Air Pollution Control Program for quality assurance management functions. The Department has sufficient technical expertise and management authority to conduct independent oversight and assure the implementation of each organization's quality system for ambient air quality monitoring. The Department is organizationally independent of environmental data generation activities performed by industrial sources. As part of the quality management function for industrial monitoring, the Department's Air Pollution Control Program and Air Quality Assurance Unit ensure the full implementation of the EPA National Performance Evaluation Programs (NPEP) for lead at all sample collection sites and at each analysis laboratory. Department QA personnel perform Technical Systems Audits (TSA) on industrial PQAOs every three years. These audits includes visits to the air monitoring sites for technical audits. The Department is also responsible for compliance with siting criteria specified in 40 CFR 58 Appendix E. The Department actively provides technical assistance to industrial monitoring organizations to ensure compliance with all data quality objectives. In addition to the QA related documentation and programs, the Department is responsible for the inclusion in the Monitoring Network Plan (this plan) of the industry-operated monitoring sites that report data to AQS. The Department is also responsible for the annual data certification procedures in AQS for industry-generated ambient air quality data. The Department ensures the raw data and QA data received from the three Doe Run networks meet the appropriate monitoring requirements. In recent years, Doe Run has standardized its operations including data processing and reporting across the three networks.

(d) All three organizations are currently supported by the same sample analysis laboratory, the Doe Run SEMO Central Laboratory located in Viburnum, Missouri. For filter analysis, SEMO uses inductively-coupled plasma mass spectrometry (ICP-MS) with abbreviated AQS method code 192. EPA has designated this analysis method as manual equivalent method EQL- 0710-192. The Doe Run method was originally developed by EPA Region 9. The official description is ‘‘Heated Nitric Acid Hot Block Digestion and ICP/MS Analysis for Pb on TSP High-Volume Filters.” The EPA FEM designation for this method was published in the Federal Register in August 2010.

1.2 St. Joe State Park Monitoring Site

The St. Joe State Park site was intended to monitor airborne lead concentrations during remediation activities involving old lead mining waste in the Federal Mine tailings. The bulk of the remediation activity was completed as of late July/early August 2014. The three-month rolling average has not exceeded the lead standard, 0.15 $\mu g/m^3$, since the site began monitoring lead on July 1, 2010. The highest three-month rolling average airborne lead concentration at that site was 0.14 $\mu g/m^3$ in July-September 2011. This elevated lead concentration was attributable to remediation activities near the monitor. During 2017 to 2019, the three-month average lead concentration has not exceeded 0.03 $\mu g/m^3$.

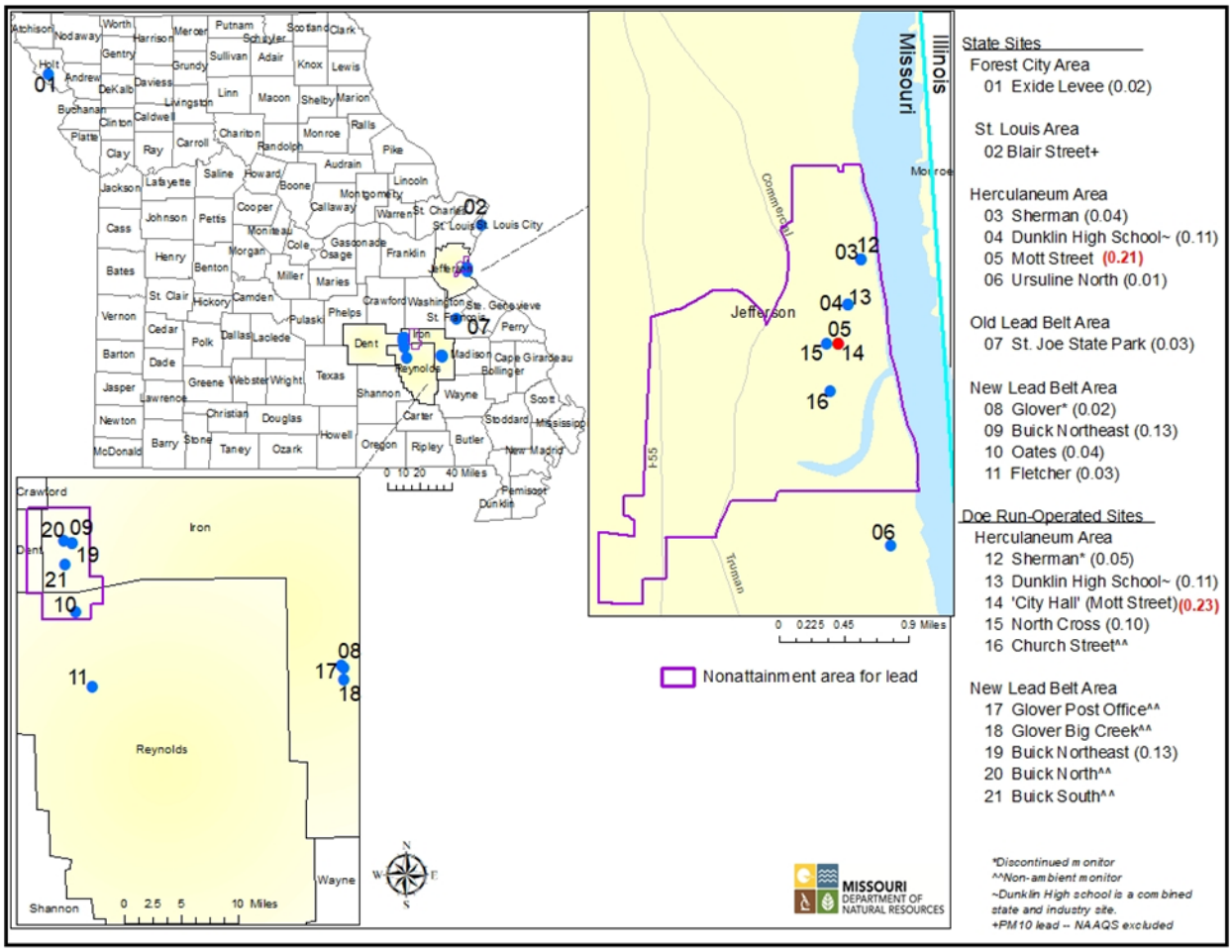
1.3 Glover Lead Monitor

The Department discontinued the Glover lead monitor at the end of April 2019 as proposed in the 2018 Monitoring Network Plan, which was approved by EPA.

The 2020 lead monitoring network is shown in the following map.

2020 Missouri Lead Monitoring Network*, NAAQS=0.15µg/m^3 (3 month).

(Numbers in parenthesis are 2017-2019 Design Values)



*Effective Jan. 1, 2020, Doe Run made the following changes in its Herculaneum monitoring network: sampling frequency at North Cross was reduced to every third day, collocated monitoring at Church Street was discontinued and monitoring at Sherman was discontinued. No other changes are proposed in this plan.

2. Sulfur Dioxide (SO_2) Monitoring Network

EPA reviewed the SO_2 standard and announced in March 2019 the standard would remain at 75 parts per billion (ppb), established in 2010. The *2011 Monitoring Network Plan* identified the minimum network monitoring required by the Population Weighted Emissions Index (PWEI). This analysis was updated using 2019 estimated population data from the United States Census Bureau and 2017 National Emission Inventory (NEI) emissions data. Results are summarized in the following table. The required numbers of monitoring sites based on the PWEI are two sites in the St. Louis CBSA, one site in the Kansas City CBSA and no others required in Missouri CBSAs. This requirement is met in the St. Louis area by the Blair Street site in Missouri and the East St. Louis site in Illinois and in the Kansas City area by the Troost site. The requirements are exceeded if the Wood River site in Illinois, the Herculaneum site in Missouri and the JFK site in Kansas are also considered. The East St. Louis site is expected to continue based on communication received from the Illinois Environmental Protection Agency.

In addition to the minimum network requirements detailed above, the Department oversees several industrial SO_2 monitoring sites and one additional site, all detailed in the following sections.

Population Weighted Emission Index (PWEI) Summary

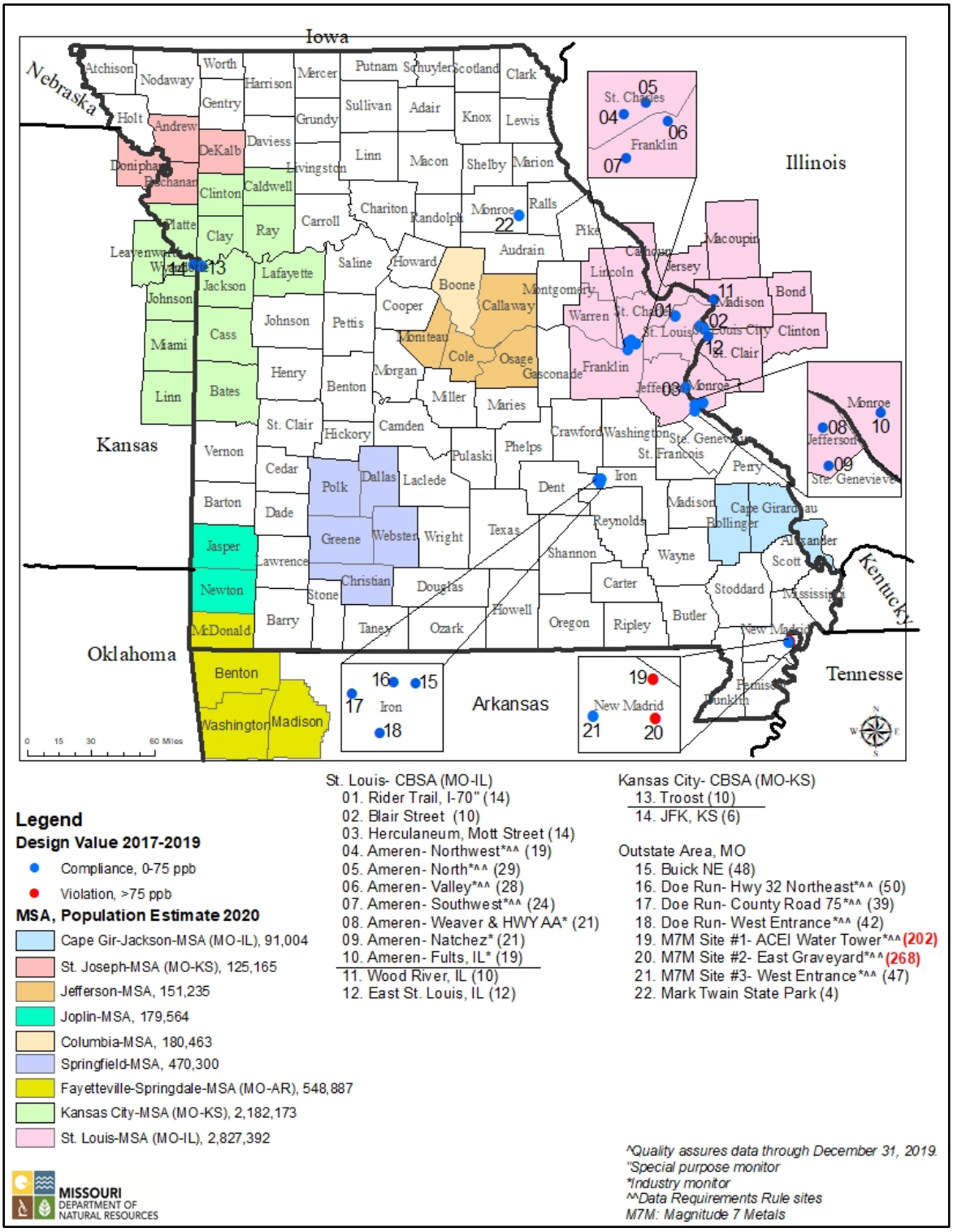
Area	Estimated 2019 Population	2017 SO2 Emissions (tpy)	PWEI	Required Number of SO2 Monitors
Kansas City	2,157,990	9,703.06	20,939	1
St. Louis	2,803,228	67,179.86	188,320	2
Fayetteville-Springdale-Rogers	557,741	2,450.66	1,367	0
Springfield	470,300	3,477.18	1,635	0
Joplin	179,564	1,244.75	224	0
Columbia	180,463	1,560.22	282	0
Jefferson City	151,235	773.09	117	0
St. Joseph	125,223	561.49	70	0
Cape Girardeau	96,765	714.96	69	0
Maryville	22,092	165.46	4	0
Warrensburg	54,062	65.01	4	0
Marshall	22,761	58.77	1	0
Sedalia	42,339	195.16	8	0
Branson	87,520	709.18	62	0
Kirksville	30,003	150.29	5	0
Moberly	24,748	16,556.63	410	0
Lebanon	35,723	187.95	7	0
Mexico	25,388	48.62	1	0
Fort Leonard Wood	52,607	128.70	7	0
Rolla	44,573	172.68	8	0
West Plains	40,117	293.39	12	0
Fort Madison-Keokuk	58,162	998.13	58	0
Quincy	75,211	895.05	67	0
Hannibal	38,839	859.58	33	0
Farmington	67,215	168.78	11	0
Poplar Bluff	42,478	179.61	8	0
Sikeston	38,280	4,746.17	182	0
Kennett	29,131	42.02	1	0

PWEI=population*SO2(tpy)/1,000,000

PWEI $\geq$ 1,000,000: 3 monitors
1,000,000 > PWEI $\geq$ 100,000: 2 monitors
100,000 > PWEI $\geq$ 5,000: 1 monitor

The Department's 2020 SO_2 monitoring network is shown in the following map.

2020 Missouri Sulfur Dioxide (SO_2) Monitoring Network*, NAAQS=75 ppb (1 hour). (Numbers in parentheses are 2017-2019 Design Values)



*No changes to the SO_2 network are proposed in this plan.

In 2015, EPA finalized the SO_2 Data Requirements Rule (DRR). This rule required air agencies to characterize air quality, either by monitoring or modeling, around sources that emit 2,000 tons per year (tpy) or more of SO_2.

Sources monitoring due to the DRR include: Ameren Labadie Energy Center, Magnitude 7 Metals (formerly Noranda Aluminum), and Doe Run Buick Resource Recycling Facility. In addition, Ameren Rush Island Energy Center is conducting monitoring on an accelerated schedule (compared to the DRR timeline) based on an agreement with the Department associated with the Jefferson County nonattainment plan submitted to EPA in May 2015. The monitoring of these sources is discussed in the following sections.

The industrial sources are conducting the monitoring, but they are conducting it in accordance with the SLAMS requirements in 40 CFR Part 58. The Department reviewed and approved the siting of the monitors based on federal regulations. To meet the requirements of the DRR, these monitors will need a minimum of three years of monitoring data, which is now complete. However, the sources cannot discontinue monitoring thereafter without EPA approval based on the requirements of 40 CFR 51.1203(c)(3) or 40 CFR 58.14.

2.1 Industrial SO_2 and Meteorological Monitoring near the Labadie and Rush Island Energy Centers

Ameren operates two SO_2 ambient Air Monitoring networks around the Labadie and Rush Island power plants. These monitors are classified as industrial SO_2 monitors. The following sections describe the current status of the Labadie and Rush Island SO_2 monitoring networks.

2.1.1 Labadie Energy Center

Two industrial SO_2 ambient air monitoring sites and a meteorological monitoring station began operation in April 2015 in the area around the Ameren Labadie Energy Center, located at 226 Labadie Power Plant Road in Franklin County. Two additional industrial SO_2 monitoring sites southwest and north of the Labadie Energy Center were installed and began operation on Jan. 1, 2017. In addition, meteorological monitoring using a 10 meter tower was added at the Northwest site. A sound detection and ranging (SODAR) instrument was initially located at the Valley site, relocated to the Northwest site in February 2017, and relocated again to the Labadie plant site in August 2017. These monitoring sites (see the following table) are operated by Ameren under a Department-approved Quality Assurance Project Plan (QAPP). The rationale for site selection based on modeling results is discussed extensively in the 2015 and 2016 Monitoring Network Plans. These monitors have not shown violation of the NAAQS, and the Department will be recommending later in 2020 that EPA redesignate the area around this facility from unclassifiable to attainment.

Summary of Labadie Area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 square meters [m^2] to 0.5 square kilometer [km^2])
Labadie Northwest -SO_2, 10 Meter Meteorological Station. (Latitude: 38.5818

Longitude: -90.865528)
Labadie Valley -SO_2, 10 Meter Meteorological Station. (Latitude: 38.572522
Longitude: -90.796911)
Labadie Southwest -SO_2, (Latitude: 38.52825 Longitude: -90.86301)
Labadie North -SO_2, (Latitude: 38.59557 Longitude: -90.82864)
Labadie Plant -SODAR, (Latitude: 38.54860 Longitude -90.83750)

2.1.2 Rush Island Energy Center

On March 23, 2015, the Department and Ameren entered into a consent agreement (see Appendix 3 of the 2015 Monitoring Network Plan) that included Ameren installing and operating an SO_2 monitoring network around the Rush Island Energy Center under Department oversight. The siting of these monitors was consistent with the technical process described in the SO_2 DRR.

The Rush Island monitoring network design was based on evaluation of dispersion modeling, as described in the 2015 and 2016 Monitoring Network Plans. This network began operation in December 2015.

Summary of Rush Island area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 m^2 to 0.5 km^2)
Weaver-AA -SO_2. (Latitude: 38.144529 Longitude: -90.304726)
Natchez -SO_2, (Latitude: 38.10525 Longitude: -90.29842)
Fults, IL, -SO_2, 10 Meter Meteorological Station (Latitude: 38.15908 Longitude: -90.22728)
Johnson Tall Tower -Meteorological Station Only, anemometers at 62.5 meter (m) and 132.5 m levels (Latitude: 38.11999 Longitude: -90.28214)

2.2 Industrial SO_2 and Meteorological Monitoring near the Doe Run Buick Resource Recycling Facility

The Doe Run Company began SO_2 monitoring at three sites in the area around the Buick Resource Recycling Facility near Boss starting Jan. 1, 2017. Meteorological monitoring is also conducted at the Buick South lead monitoring site, south of the facility. These sites are operated under a Department-approved QAPP, which includes performance evaluations (audits) by Department staff. Locations of these ambient SO_2 monitoring sites was determined on the basis of air quality modeling of the impact of facility emissions, as described in the 2016 Monitoring Network Plan. These monitors have not shown violation of the NAAQS, and the Department has recommended the area surrounding this facility in Iron County be designated as attainment/unclassifiable. EPA is expected to act on this recommendation by the end of 2020.

Summary of Doe Run Buick area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 m^2 to 0.5 km^2)
West Entrance -SO_2. (Latitude: 37.63211 Longitude: -91.13565)
County Road 75 -SO_2, (Latitude: 37.64876 Longitude: -91.14890)
Hwy. 32 Northeast (Former PSD site) -SO_2, (Latitude: 37.65319 Longitude: 91.12795)

2.3 Industrial SO_2 and Meteorological Monitoring near the Magnitude 7 Metals (formerly Noranda Aluminum) Facility

Magnitude 7 Metals is conducting SO_2 monitoring at three sites and meteorological monitoring at one site in the area around its facility near New Madrid. Monitoring at these sites started in January 2017. These sites are operated under a Department-approved QAPP, which includes performance evaluations (audits) by Department staff. Locations for these ambient SO_2 monitoring sites were determined on the basis of air quality modeling of the impact of facility emissions, and the potential area for meteorological monitoring was determined on the basis of an analysis by a Department meteorologist. These evaluations are described in the *2016 Monitoring Network Plan*.

Two of the Magnitude 7 Metals sites are in violation of the NAAQS based on 2017 through 2019 data. The State of Missouri has recommended designation of an area surrounding the facility as a nonattainment area for the SO_2 NAAQS and the remainder of New Madrid County as attainment/unclassifiable. EPA is expected to act on this recommendation by the end of 2020.

Summary of Magnitude 7 Metals area Industrial Monitoring Stations:
Monitoring Objective: Source Oriented
Spatial Scale of representativeness: Middle Scale (100 m^2 to 0.5 km^2)
Site 1 -SO_2, (Latitude: 36.51361 Longitude: -89.56111)
Site 2 -SO_2, (Latitude: 36.50861 Longitude: -89.56083)
Site 3 -SO_2 and Meteorology, (Latitude: 36.50889 Longitude: -89.57083)

2.4 Rider Trail I-70 Site

The Department added an SO_2 monitor, designated as SPM, to the existing Rider Trail I-70 monitoring site in May 2016 to evaluate SO_2 levels in the general area. Since the site was installed the annual fourth highest daily one-hour SO_2 concentration has ranged from 12 to 15 ppb.

Since the monitor is located in the near-roadway environment, and there are several SO_2 sources in the area, the Department initially classified the spatial scale of representativeness of the SO_2 measurements as middle-scale. This classification may be reevaluated if trends in the monitoring data and other analysis warrant increasing the spatial scale of representativeness. The monitoring objective for this monitor is to measure population exposure.

3. National Air Toxics Trends Stations (NATTS), and Other Non-Criteria Pollutant Special Purpose Monitoring

3.1 National Air Toxics Trends Stations Monitoring

Routine NATTS monitoring will continue at Blair Street as described in the NATTS work plan.

3.2 Black Carbon

Black Carbon is monitored with an aethalometer as part of the NATTS program at Blair Street. Also, as part of the condition of receiving one time section 103 grant funds to implement sites for the near-roadway monitoring network, the Department will continue to conduct special purpose $PM_{2.5}$ black carbon monitoring at the Forest Park and Blue Ridge I-70 near- roadway NO_2 sites using aethalometers.

4. $PM_{2.5}$ Monitoring Network

4.1 $PM_{2.5}$ SLAMS Network

The minimum monitoring requirement, based on population and historic $PM_{2.5}$ measurements (40 CFR 58 Appendix D) requires three sites in St. Louis (because of $PM_{2.5}$ concentrations measured on the Illinois side) and two sites in Kansas City. The St. Louis requirement is met by four Missouri sites plus three Illinois sites in the St. Louis CBSA (in addition to the near-road sites). The Kansas City requirement is met by three Missouri sites plus three Kansas sites in the Kansas City CBSA (in addition to the near-road site).

There is only one $PM_{2.5}$ monitor in Missouri that is not applicable for comparison to the annual NAAQS. The Branch Street site is a middle-scale site focused on a group of sources in the industrial riverfront area and is not representative of neighborhood or larger spatial scale for $PM_{2.5}$ monitoring. The $PM_{2.5}$ monitors deployed to collocate with the near-roadway NO_2 monitors are micro-scale monitors, but EPA has indicated in 40 CFR 58 Appendix D, 4.7.1(c)(2) that "In many situations, monitoring sites that are representative of microscale or middle-scale impacts are not unique and are representative of many similar situations. This can occur along traffic corridors or other locations in a residential district. In this case, one location is representative of a number of small scale sites and is appropriate for evaluation of long-term or chronic effects." EPA may consider these monitors representative of larger areas near roadways and comparable to the annual $PM_{2.5}$ NAAQS consistent with 40 CFR 58.30.

The requirement for regional background $PM_{2.5}$ monitoring is met by the Hercules Glades and Mingo Interagency Monitoring of Protected Visual Environments (IMPROVE) sites. In addition to these sites, the Arnold West and El Dorado Springs sites also serve to monitor transport into eastern and western Missouri urban areas respectively.

TEOM-1405-DF and TEOM-1405-F instruments are the primary instruments being used in the state network for $PM_{2.5}$ measurement. EPA has also designated the TEOM-1405-DF, operating with firmware version 1.70 and later, as a Federal Equivalent Method (FEM) for PM_{10} and $PM_{10\text{-}2.5}$, announced on Nov. 12, 2013. However, the Department does not report data from the PM_{10} FEM channels of the TEOM-1405-DF instruments to AQS.

Network $PM_{2.5}$ 1405-DF FEM/FRM collocation requirements are satisfied at the Blair Street NCore site in St. Louis. The following figure shows FRM/FEM comparability statistics (Class III performance criteria of 40 CFR Part 53) for the TEOM-1405-DF (EQPM-0609-182) operating at the Blair Street, St. Louis site. The additive and multiplicative bias meets the Class III performance criteria of 40 CFR Part 53.

The Department has begun the process of obtaining retrofits of the 1405-DF instruments to 1405-Fs. To date (June 2020) 1405-F instruments are being operated at six sites; see the table at the end of this section. Two additional sites (St. Joseph; two monitors and Richards Gebaur South) are planned to be converted to 1405-F operation in 2021, subject to the availability of funds. The "Revisions to Ambient Monitoring Quality Assurance and Other Requirements; Final Rule," (*Federal Register*, volume 81, number 59, March 28, 2016), effective April 27, 2016, removed

the requirement for collocated monitoring for $PM_{10-2.5}$ at NCore sites from 40 CFR Part 58. Therefore, operation of the collocated set of filter samplers used for measurement of $PM_{10-2.5}$ was discontinued at the Blair Street site. At the same time, the TEOM-1405-DF FEM was re-designated as the primary $PM_{2.5}$ instrument at this site. The FRM $PM_{2.5}$ sampler at Blair Street was re-designated as the collocated reporting FRM sampler for the state network, and also provides FRM $PM_{2.5}$ for the NCore site. This change allowed the collocated FRM $PM_{2.5}$ sampler at the Troost site to be discontinued. Effective July 1, 2018, $PM_{10-2.5}$ is now being reported only at the Blair Street NCore site and the Forest Park and Blue Ridge I-70 near road sites. The current $PM_{2.5}$ network is summarized in the table entitled "2020 Missouri $PM_{2.5}$ Monitoring Network" later in this section.

Two TEOM-1405-DF instruments are operated at the St. Joseph Pump Station site, one designated as primary, and one as collocated to satisfy the collocation requirement for that FEM method. The Department will continue to operate a 1405-F $PM_{2.5}$ instrument and a collocated FRM at Ladue.

The Department is also operating two Teledyne API 640x instruments at Blair Street and one at Troost as a special purpose monitor for PM_{10} measurement and to evaluate this instrument, which measures airborne particulate concentration using light scattering, for possible future use in the $PM_{2.5}$ network. The two 640x instruments at Blair Street are showing excellent agreement. Therefore, in order to further evaluate the instrument, one of the 640x instruments at Blair Street will be relocated to the Branch Street in order to evaluate its performance in a location with a higher atmospheric particulate concentration. This relocation is tentatively planned for June 2020.

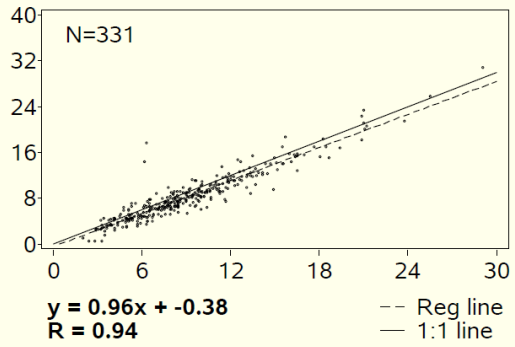
FRM/FEM Comparability Assessment
Blair Street, St. Louis, 2017-2019
from EPA $PM_{2.5}$ Continuous Monitor Comparability Assessments

$PM_{2.5}$ Continuous Monitor Comparability Assessment

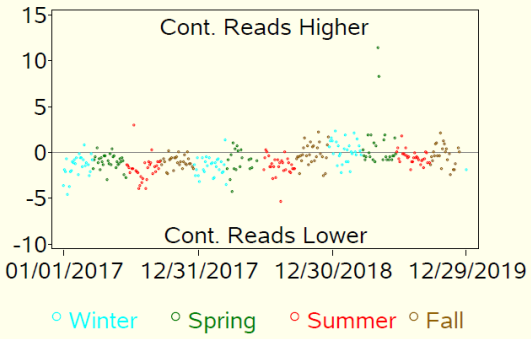
Site 29-510-0085: St. Louis, MO

FRM: R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC - Gravimetric (118,145), PM2.5 - Local Conditions (88101), POC=1,2
Cont: Thermo Scientific TEOM 1405-DF Dichotomous FDMS - FDMS Gravimetric (182), PM2.5 - Local Conditions (88101), POC=4

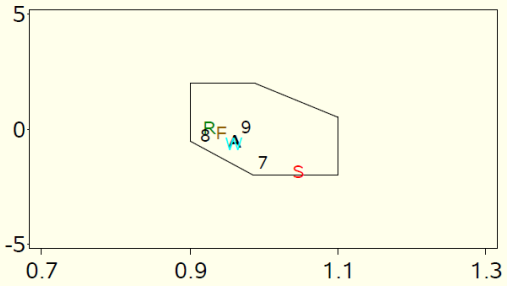
Cont. (y) vs. FRM (x) ($\mu g/m^3$)



Cont. minus FRM ($\mu g/m^3$)

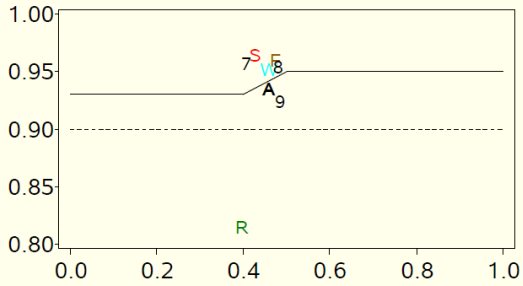


Additive (y) vs. Multiplicative (x) Bias



A=AllData, 7=2017, 8=2018, 9=2019
W=Winter, R=Spring, S=Summer, F=Fall

R (y) vs. FRM CCV (x)



A=AllData, 7=2017, 8=2018, 9=2019
W=Winter, R=Spring, S=Summer, F=Fall

Mean Concentration ($\mu g/m^3$)

Dataset	N	FRM	Cont	Ratio (Cont/FRM)
AllData	**331**	**9.1**	**8.4**	**0.92**
Winter	85	10.1	9.2	0.91
Spring	75	7.9	7.5	0.96
Summer	89	10.0	8.8	0.88
Fall	82	8.3	7.9	0.95
2017	120	9.0	7.7	0.85
2018	105	9.5	8.6	0.91
2019	106	9.0	9.0	1.00

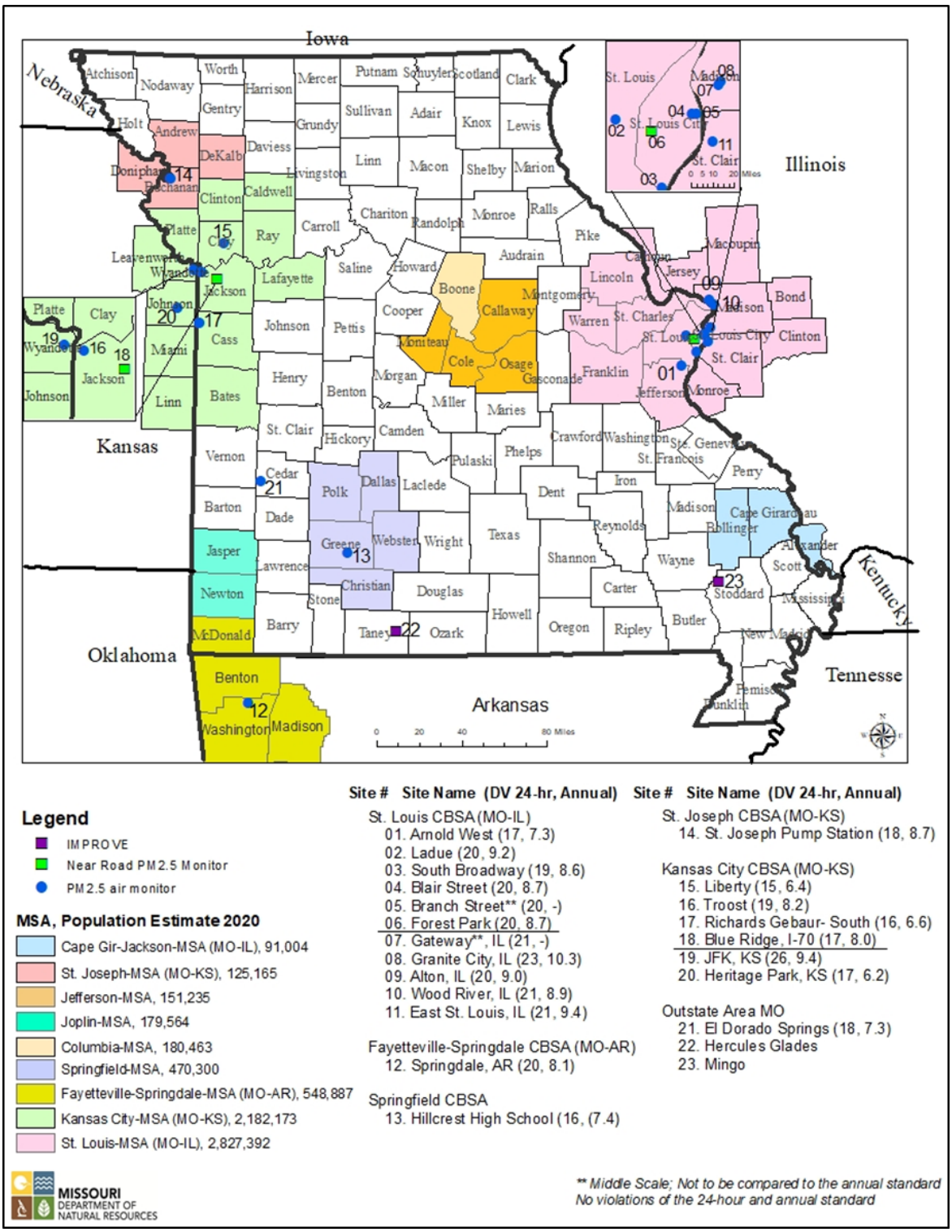
Appendix A Statistics

Dataset	N (all observations)	Bias	N (only >= 3 ug/m^3)	Bias
AllData	**331**	**-8.8**	**317**	**-7.6**
Winter	85	-9.7	83	-8.4
Spring	75	-4.9	69	-2.4
Summer	89	-14	87	-13
Fall	82	-5.4	78	-4.7
2017	120	-17	113	-16
2018	105	-9.4	103	-8.8
2019	106	1.2	101	2.8

Data Source: EPA AQS Data Mart

Generated: May 20, 2020

2020 Missouri $PM_{2.5}$ Monitoring Network*, NAAQS=35 µg/m³ (24 hours), 12 µg/m³ (Annual). (Numbers in parentheses are 2017-2019 Design Values for the 24-hour and Annual standards)



*No changes to the $PM_{2.5}$ network are proposed in this plan other than continuing retrofitting of 1405-DF instruments to 1405-F.

4.2 $PM_{2.5}$ Chemical Speciation Network (CSN)

$PM_{2.5}$ speciation sampling is currently conducted at two locations: Blair Street in St. Louis and Arnold West. The sampling schedule at Arnold West was modified to every six days in February 2015. Sampling is done every three days at Blair Street.

4.3 $PM_{2.5}$ Section 103 Federal Funding

The Department is not proposing any changes to the $PM_{2.5}$ monitoring network other than replacement of aging equipment. However, this plan is contingent on EPA providing adequate grant funds to operate and maintain the $PM_{2.5}$ monitoring network.

40 CFR 58.14 (c) indicates "State, or where appropriate, local agency requests for SLAMS monitor station discontinuation, subject to the review of the Regional Administrator, will be approved if any of the following criteria are met and if the requirements of appendix D to this part, if any, continue to be met. Other requests for discontinuation may also be approved on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of a NAAQS and if the requirements of appendix D to this part, if any, continue to be met." Consistent with 40 CFR 58.14(b), if reductions become necessary, the Department will provide written communication describing the network changes to the EPA Regional Administrator for review and approval.

2020 Missouri $PM_{2.5}$ Monitoring Network

Site	Schedule*	Type	Agency	Purpose
St. Louis				
1. Blair Street	3	Collocated FRM	ESP	Ncore and Quality Assurance
	3	Speciation	ESP	Chemical Speciation Network
	H	TEOM-1405-DF FEM	ESP	24 hr & Annual NAAQS/AQI, Ncore, PM10-2.5 continous
	H	2 T640X PM Mass Monitor FEMs	ESP	Method Performance Evaluation/Research. Not for NAAQS Compliance Determination
2. Branch Street	H	TEOM-1405-F FEM	ESP	24 hr NAAQS/AQI (unique middle scale monitor†)
3. Forest Park, I-64 (near-roadway)	H	TEOM-1405-DF FEM	ESP	24 hr & Annual/AQI, PM10-2.5 continuous (micro scale monitor)
4. South Broadway	H	TEOM-1405-F FEM	ESP	24 hr & Annual NAAQS/AQI
5. Ladue	H	TEOM-1405-F FEM	ESP	24 hr & Annual NAAQS/AQI
	6	Collocated FRM	ESP	Quality Assurance
6. Arnold West	6	Speciation	ESP	Chemical Speciation Network
	H	TEOM-1405-F FEM	ESP	24 hr & Annual NAAQS/AQI
Kansas City				
7. Liberty	H	TEOM-1405-DF FEM	ESP	24 hr & Annual NAAQS/AQI
	H			
8. Troost	H	TEOM-1405-F FEM	ESP	24 hr & Annual NAAQS/AQI
		T640X PM Mass Monitor FEM	ESP	Method Performance Evaluation/Research. Not for NAAQS Compliance Determination
9. Blue Ridge I-70 (near-roadway)	H	TEOM-1405-DF FEM	ESP	24 hr & Annual/AQI, PM10-2.5 continuous (micro scale monitor)
10. Richards-Gebaur South	H	TEOM-1405-DF FEM	ESP	24 hr & Annual NAAQS/AQI
Springfield				
11. Hillcrest High School	H	TEOM-1405-DF FEM	ESP	24 hr & Annual NAAQS/AQI
Outstate				
12. St. Joseph Pump Station	H	TEOM-1405-DF FEM	ESP	24 hr & Annual NAAQS/AQI
	H	Collocated TEOM-1405-DF FEM	ESP	Quality Assurance
13. ElDorado Springs	H	TEOM-1405-F FEM	ESP	24 hr & Annual/AQI
14. Mingo	3	IMPROVE	Fish & Wildlife Service	Chemical Speciation Network
15. Hercules Glades	3	IMPROVE	Forest Service	Chemical Speciation Network

* 3 = Every third day; 6 = Every sixth day; H = Continuous monitoring, hourly data reported.

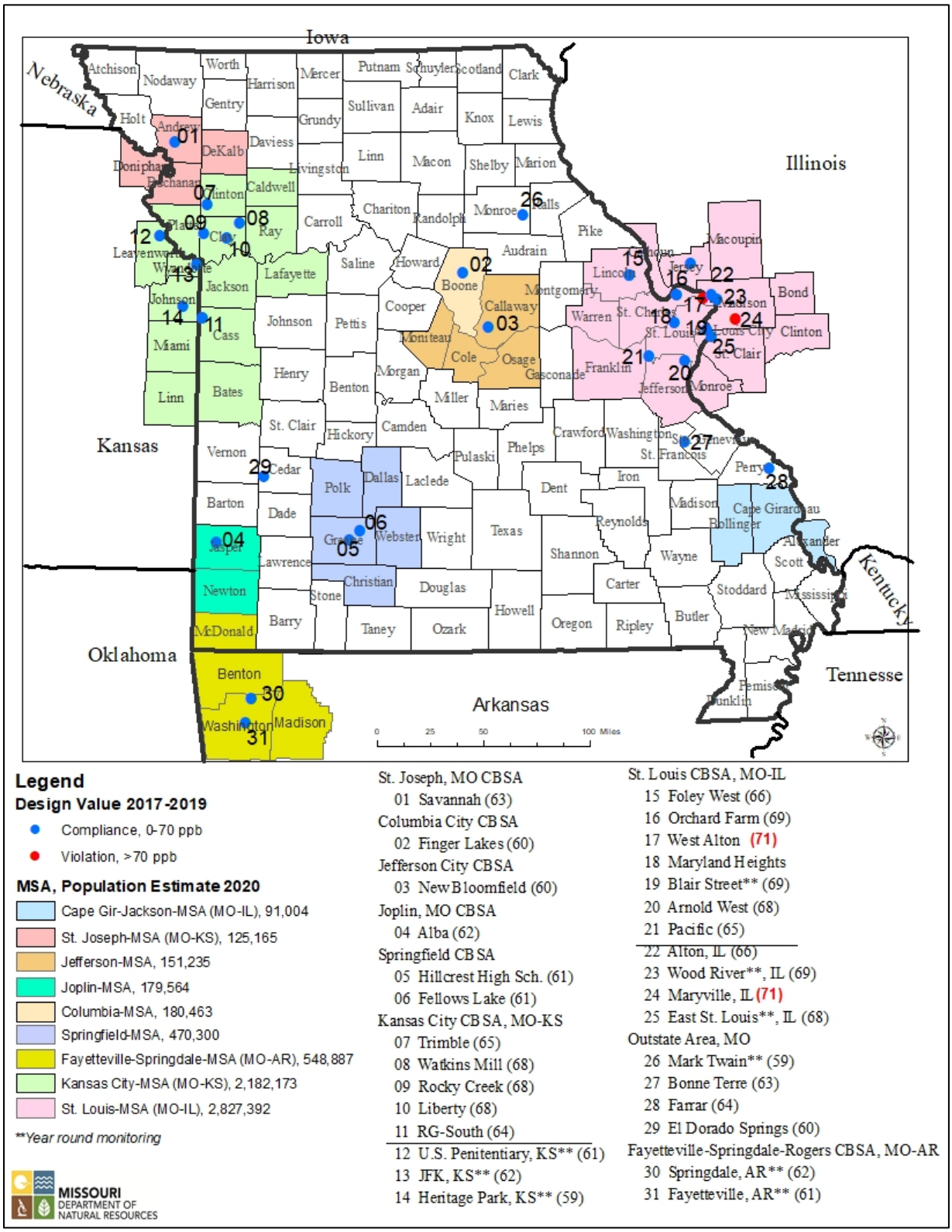
† The Branch St. Monitor is a unique middle scale impact site and not eligible for comparison to the Annual $PM_{2.5}$ NAAQS consistent with 40 CFR 58.30.

5. Ozone Monitoring Network

There are no planned changes to the ozone monitoring network other than modification of the West Alton site as described below. Ozone monitoring will continue all year at the Mark Twain State Park (MTSP) site to collect ozone background concentrations need for Prevention of Significant Deterioration (PSD) modeling projects and at Blair Street to meet the NCore ozone monitoring requirement. The current monitoring network is based on the current ozone standard and ground-level ozone air quality monitoring network design requirements. The current ozone monitoring network meets the population-based requirements in 40 CFR 58 Appendix D, which requires a minimum of two sites each in the St. Louis, Kansas City and Springfield areas. The ozone monitoring requirement for the Fayetteville-Springdale-Rogers CBSA is met by two ozone monitoring sites in Arkansas, since 96% of the population of that CBSA is in Arkansas and only 4% in Missouri.

The West Alton site is located about 16 miles north of the center of St. Louis between the Missouri and Mississippi rivers and about seven miles northwest of their confluence. The West Alton area is relatively flat, with elevation about 420 to 430 feet above sea level. The area is subject to flooding when the water level in the rivers rises, and there was widespread flooding in the area during spring and early summer 2019. The site was inoperative from May 2 to 16 and May 22 to July 16, 2019, because it was removed to avoid damage due to flooding. The Department has evaluated the days with missing O_3 measurement at West Alton based on temperature and on ozone concentrations measured at nearby sites. Based on this evaluation, 62 of the 72 missing days were not conducive to ozone concentrations above the level of the standard. This evaluation has been submitted to EPA Region 7 for approval. If this analysis is acceptable to EPA, the data completeness requirement for the site will still be met in 2019. However, because of its importance as the design value site for the St. Louis area, a cost estimate and plan are being developed for elevation of the West Alton monitoring site above the 2019 high water level while still meeting probe height requirements to minimize outages related to flooding in future years.

2020 Missouri Ozone (O_3) Monitoring Network*, NAAQS=70 ppb (8 hour).
(Numbers in parentheses are 2017-2019 Design Values)



Legend

Design Value 2017-2019

- Compliance, 0-70 ppb
- Violation, >70 ppb

MSA, Population Estimate 2020

- Cape Gir-Jackson-MSA (MO-IL), 91,004
- St. Joseph-MSA (MO-KS), 125,165
- Jefferson-MSA, 151,235
- Joplin-MSA, 179,564
- Columbia-MSA, 180,463
- Springfield-MSA, 470,300
- Fayetteville-Springdale-MSA (MO-AR), 548,887
- Kansas City-MSA (MO-KS), 2,182,173
- St. Louis-MSA (MO-IL), 2,827,392

**Year round monitoring*

MISSOURI DEPARTMENT OF NATURAL RESOURCES

St. Joseph, MO CBSA
- 01 Savannah (63)

Columbia City CBSA
- 02 Finger Lakes (60)

Jefferson City CBSA
- 03 New Bloomfield (60)

Joplin, MO CBSA
- 04 Alba (62)

Springfield CBSA
- 05 Hillcrest High Sch. (61)
- 06 Fellows Lake (61)

Kansas City CBSA, MO-KS
- 07 Trimble (65)
- 08 Watkins Mill (68)
- 09 Rocky Creek (68)
- 10 Liberty (68)
- 11 RG-South (64)
- 12 U.S. Penitentiary, KS** (61)
- 13 JFK, KS** (62)
- 14 Heritage Park, KS** (59)

St. Louis CBSA, MO-IL
- 15 Foley West (66)
- 16 Orchard Farm (69)
- 17 West Alton **(71)**
- 18 Maryland Heights
- 19 Blair Street** (69)
- 20 Arnold West (68)
- 21 Pacific (65)
- 22 Alton, IL (66)
- 23 Wood River**, IL (69)
- 24 Maryville, IL **(71)**
- 25 East St. Louis**, IL (68)

Outstate Area, MO
- 26 Mark Twain** (59)
- 27 Bonne Terre (63)
- 28 Farrar (64)
- 29 El Dorado Springs (60)

Fayetteville-Springdale-Rogers CBSA, MO-AR
- 30 Springdale, AR** (62)
- 31 Fayetteville, AR** (61)

*No changes to the O_3 network are proposed in this plan other than elevation of the West Alton site.

6. PM_{10} Monitoring Network

The Department discontinued collocated FRM PM_{10} monitoring at the Blair Street in St. Louis in February 2018, because the FRM PM_{10} measurement has been replaced as the primary measurement with the Teledyne API 640X instrument. Collocation is only required for manual samplers (40 CFR 58 Appendix A, 3.3.4). The Department also discontinued the other FRM PM_{10} monitor at the Blair Street site effective July 1, 2019, because the Teledyne API 640X was designated as the primary PM_{10} instrument and is also being used to report PMCoarse.

The St. Louis CBSA includes four PM_{10} sites (not including the microscale Forest Park site), enough to meet the minimum monitoring requirement of four to eight sites specified in 40 CFR 58 Appendix D, 4.6. This monitor count includes the Granite City Fire Station site in Illinois, which is expected to continue based on communication received from the Illinois Environmental Protection Agency.

The PM_{10} minimum monitoring requirement of two to four sites in the Kansas City CBSA is met by the Front Street site in Missouri and the JFK site in Kansas. The JFK site will continue, because it is the NCore site for the Kansas City area, as confirmed by the 2020 Kansas Air Monitoring Network Plan.

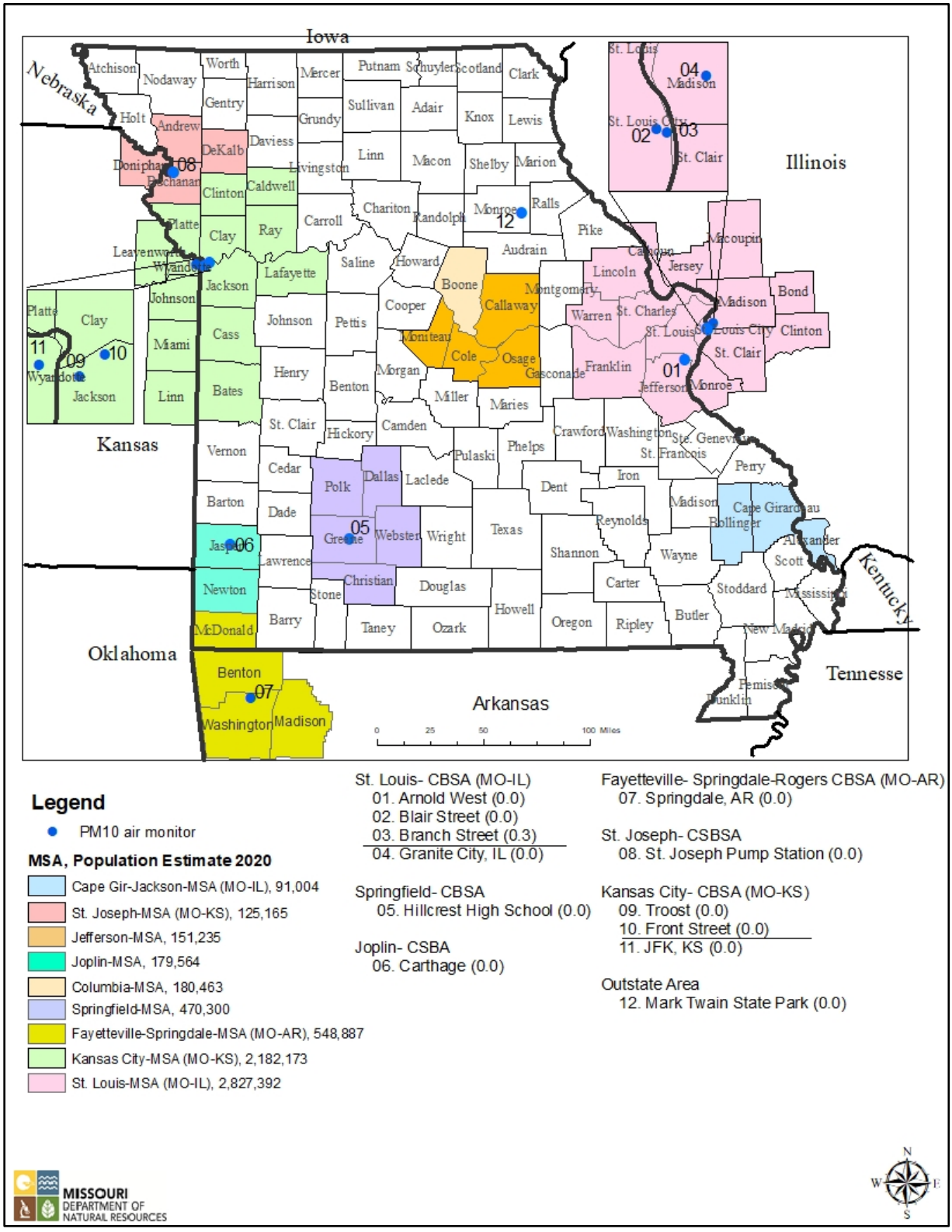
In February 2019, the Department began monitoring PM_{10} and $PM_{2.5}$ at Troost with a Teledyne API 640X instrument as a special purpose monitor for the purpose of ongoing evaluation of the performance of that instrument.

The PM_{10} minimum monitoring requirement of zero to one in the Springfield CBSA is met by the Hillcrest High School site. The 2019 estimated population of the Springfield CBSA is 470,300. If this population increases to 500,000 or more, the requirement will increase to one to two sites and will continue to be met.

The 2019 estimated population of the Fayetteville-Springdale-Rogers CBSA is 557,741, but only 4% of this population (22,837) is in Missouri. Therefore, the PM_{10} monitoring requirement for this area is best met by a monitoring site in Arkansas. Based on correspondence from the Arkansas Department of Environmental Quality, such a site was established on Jan. 1, 2017.

A collocated PM_{10} TEOM-1400ab monitor was installed at the Carthage site in April 2016 and continues to operate because of the importance of that site as being near a potential source.

2020 Missouri PM_{10} Monitoring Network*, NAAQS=150 µg/m³ (24 hour).
(Numbers in parentheses are 2017-2019 Design Values)



* No changes to the PM_{10} network are proposed in this plan.

7. Nitrogen Dioxide (NO_2) Monitoring Network

The 2010 NO_2 NAAQS revision rule required near-road NO_2 monitoring at two sites in the St. Louis CBSA (population 2.8 million) and one site in the Kansas City CBSA (population 2.2 million), based on population and traffic count. The Department established the first St. Louis area site in January 2013, the Kansas City area site in July 2013, and the second near-roadway site in the St. Louis area in January 2015.

The first St. Louis area near-roadway site, Forest Park, is located adjacent to I-64 west of downtown St. Louis. Air monitoring results at that site are consistent with commuter traffic, heaviest on weekday mornings. The second St. Louis area site, called Rider Trail, I-70, is adjacent to Interstate 70, just west of Interstate 270. Interstate 70 extends across the United States and carries through traffic in addition to commuter traffic and other local traffic. Therefore, the fleet mix and congestion patterns relative to time of day and day of the week are expected to be different than at the first site

The community-wide monitoring network requirement of 40 CFR 58 Appendix D, 4.3.3(a) in CBSAs with population larger than 1 million is satisfied by the Troost site in Kansas City and the Blair Street site in St. Louis and exceeded if the JFK site in Kansas and the East St. Louis site in Illinois are also considered.

40 CFR 58, Appendix D, 4.3.4 includes the following additional requirement for NO_2 monitoring:

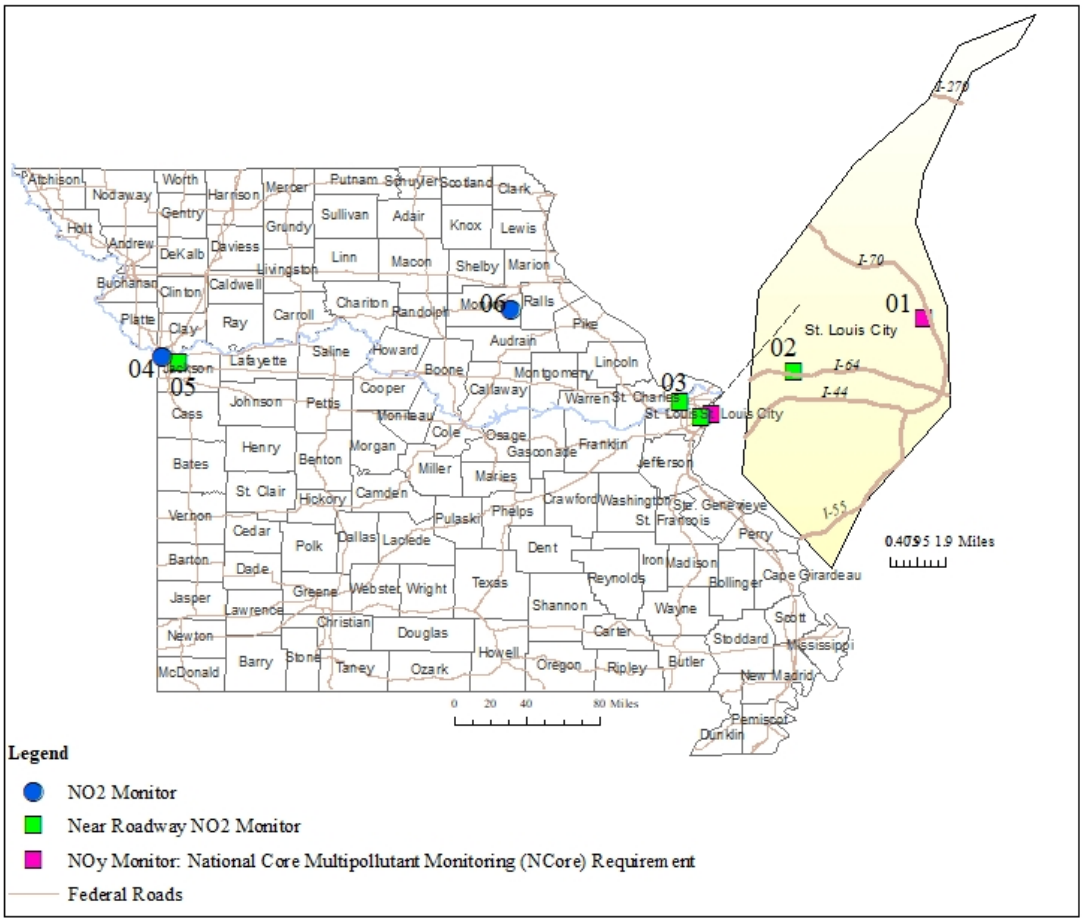
"4.3.4 Regional Administrator Required Monitoring

1. The Regional Administrators, in collaboration with States, must require a minimum of forty additional NO_2 monitoring stations nationwide in any area, inside or outside of CBSAs, above the minimum monitoring requirements, with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations…."

The Department discontinued NO_2 monitoring at the Margaretta site at the beginning of 2019 and requested that EPA designate the Blair Street site as being in an area where susceptible and vulnerable populations live, work and play, therefore meeting this requirement.

The Department is currently operating a photolytic NO_2 monitor at the Blair Street site. Photolytic NO_2 monitoring is identified in EPA's long term monitoring strategy, and this monitoring supplements the required NOy monitoring being conducted at the Blair Street NCore site. The Department plans to replace the photolytic NO_2 monitor with a cavity attenuated phase shift CAPS) $NO/NO_2/NOx$ analyzer. Either instrument would satisfy the requirement for true NO_2 monitoring as part of the PAMS program (see Section 9).

2020 Missouri Nitrogen Dioxide (NO_2) Monitoring Network*, NAAQS=100 ppb (1 hour). (Numbers in parentheses are 2017-2019 Design Values)



Site# SiteName (2017-2019 DV)

St. Louis Area
- 01 Blair Street (46)
- 02 Forest Park (45)
- 03 Rider Trail, I-70 (40)

Kansas City Area
- 04 Troost (47)
- 05 Blue Ridge, I-70 (43)

Outstate Area
- 06 Mark Twain State Park (9)

MISSOURI DEPARTMENT OF NATURAL RESOURCES

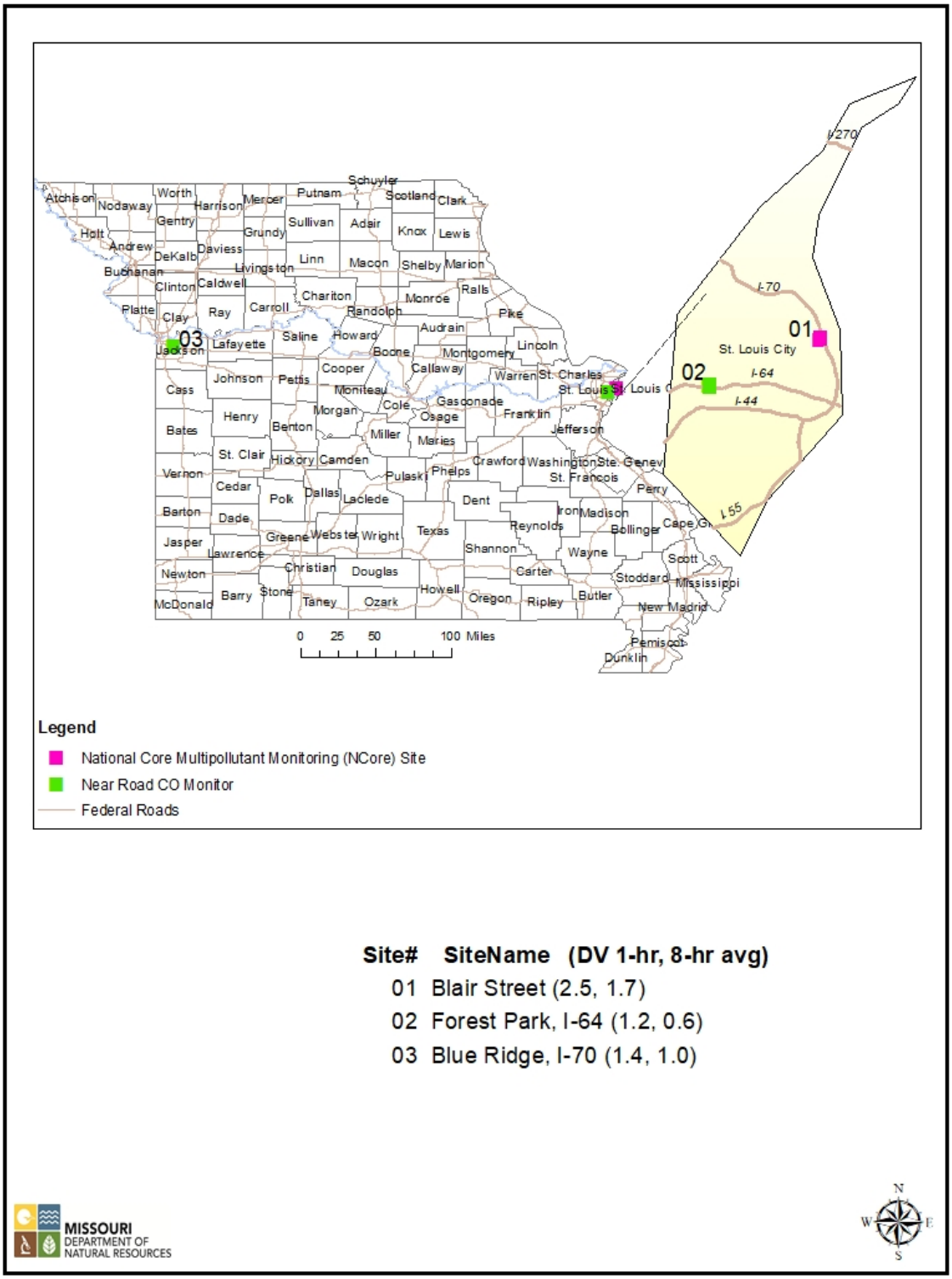
N W E S

*No changes to the NO_2 network are proposed in this plan.

8. Carbon Monoxide (CO) Monitoring Network

The 2013 NAAQS rule for CO requires near-road CO monitoring at one site in the St. Louis CBSA. The Department established CO monitoring sites at the same time as the NO_2 monitoring sites at the Forest Park I-40/64 and Blue Ridge I-70 near-roadway monitoring sites. No changes to the CO monitoring network are proposed in this plan.

2020 Missouri Carbon Monoxide (CO) Monitoring Network*, NAAQS=35 ppm (1 hour), 9 ppm (8 hour). (Numbers in parentheses are 2017-2019 Design Values for the 1-hour and 8-hour standards)



*No changes to the CO network are proposed in this plan.

9. Photochemical Assessment Monitoring Station Implementation Plan

9.1 Introduction: Regulatory Requirements and Guidance Documents

The "National Ambient Air Quality Standards for Ozone; Final Rule," (*Federal Register*, volume 80, number 206, Oct. 26, 2015), included amendment of 40 CFR 58, Appendix D (5) to include the following:

> "5. NETWORK DESIGN FOR PHOTOCHEMICAL ASSESSMENT MONITORING STATIONS (PAMS) AND ENHANCED OZONE MONITORING
>
> 1. State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.
>
> 2. PAMS measurements will include:
>
> (1) Hourly averaged speciated volatile organic compounds (VOCs);
> (2) Three 8-hour averaged carbonyl samples per day on a 1 in 3 day schedule, or hourly averaged formaldehyde;
> (3) Hourly averaged O_3;
> (4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO_2), and total reactive nitrogen (NOy);
> (5) Hourly averaged ambient temperature;
> (6) Hourly vector-averaged wind direction;
> (7) Hourly vector-averaged wind speed;
> (8) Hourly average atmospheric pressure;
> (9) Hourly averaged relative humidity;
> (10) Hourly precipitation;
> (11) Hourly averaged mixing-height;
> (12) Hourly averaged solar radiation; and
> (13) Hourly averaged ultraviolet radiation…
>
> (g) At a minimum, the monitoring agency shall collect the required PAMS measurements during the months of June, July and August."

The same rule included amendment of 40 CFR 58.10 (a) (10) to include the following:

> "A plan for making Photochemical Assessment Monitoring Stations (PAMS) measurements, if applicable, in accordance with the requirements of appendix D paragraph 5(a) of this part shall be submitted to the EPA Regional Administrator no later than July 1, 2018. The plan shall provide for the required PAMS measurements to begin by June 1, 2019."

Primarily because of delays in national procurement of some of the required equipment for PAMS measurement, EPA revised this regulation to change the required start date for PAMS measurement to June 1, 2021 (*Federal Register*, volume 85, number 5, Jan. 8, 2020, page 834).

EPA has published a guidance document entitled *PAMS Required Sites Quality Assurance Implementation Plan [QAIP],* October 2016. The QAIP provides guidance for both EPA and monitoring organizations in implementation of the above-referenced PAMS requirements. The QAIP includes the following recommendations:

> "Monitoring organization PAMS Implementation Plan: The monitoring organization Implementation Plan document will specify how the monitoring organization will perform the measurements for the Required Network. The plan will include details on activities such as monitoring site location, costs and schedule of events, among other information. The plan will also include any waivers to siting or monitoring methods." (page 13).
>
> "Monitoring organizations should have their PAMS waivers and Required Network Implementation Plans finalized by July 2017 and must have them completed by the end of October 2017.[20]
> [20] The regulation requires that monitoring organization Required Network IPs be developed in their Annual Network Plans due July 2018. However, in order to be operational by June 2019, it would be beneficial to have plans finalized by the end of October 2017." (page 21).

EPA has provided additional guidance including a PAMS Technical Assistance Document (TAD) and a model Quality Assurance Project Plan (QAPP), both finalized in June 2019, and draft standard operating procedures for some of the instrument systems. EPA also conducts monthly conference calls to disseminate information and guidance on PAMS monitoring.

This section of the 2018 Monitoring Network Plan was intended to fulfill the regulatory requirement in 40 CFR 58.10 (a) (10) for submittal of a PAMS implementation plan by July 2018. An earlier version of this section was included in the 2017 Monitoring Network Plan to meet the recommended schedule in the QAIP for submittal of the plan by July 2017 in advance of the regulatory requirement. The current version of this section has been revised to reflect the schedule delays, regulatory changes and EPA guidance identified above.

9.2 PAMS Measurements

The Department will conduct PAMS monitoring at the Blair Street Station in St. Louis. The Blair Street Station is an NCore site in a CBSA with a population of greater than 1 million. The Kansas City, Kansas NCore site will also be a PAMS site according to the 2020 Kansas Air Monitoring Network Plan. PAMS monitoring will begin at Blair Street by June 1, 2021 and will be conducted during the months of June, July and August each year as long as the regulatory requirements are in place and funding is available to support this activity.

The Department does not plan to request any of the waivers from EPA described in 40 CFR 58, Appendix D (5) (c) through (f).

Each of the required measurements in 40 CFR 58, Appendix D (5) (b) is discussed below.

9.2.1. Hourly Averaged Speciated Volatile Organic Compounds (VOCs)

EPA has evaluated several gas chromatographs (GC) designed to measure concentrations of hourly average speciated VOCs. EPA is developing contracts with two of the vendors of these GC systems and plans to provide an instrument from one of the vendors to each monitoring organization that is required to conduct PAMS monitoring and chooses to acquire the GC system through one of the EPA contracts. Based on information available at this time, the Department has selected the Consolidated Analytical Systems (CAS)/Chromatotec AirmOzone Auto-Gas Chromatograph with Flame Ionization Detection. Use of this system will also require procurement and installation of additional equipment and supplies, including a sampling manifold, zero air supply, gas dilution calibrator, calibration gas and associated regulators, and data logger. This list will be refined and become more detailed as more information becomes available. This element of the required PAMS measurements is clearly the one that will require the most planning and preparation and will be the most labor-intensive during each summer measurement season. The Department expects to receive the GC during June 2020 and begin familiarization with the instrument during summer 2020 in preparation for operation in 2021.

The following table lists target compounds for this measurement (carbonyl compounds included in the table will be measured in samples described under 2 below).

9.2.2 Three 8-hour Averaged Carbonyl Samples per Day on a 1 in 3 Day Schedule, or Hourly Averaged Formaldehyde

The Department will install and use a sampler capable of collecting multiple 8-hour samples using derivatized sorbent tubes according to EPA method TO-11A. An example of such a sampler is the ATEC 8000 series. The Department is not aware of an instrument currently available at reasonable cost that reliably measures hourly-averaged formaldehyde; this provision was likely written into the regulation in anticipation of future instrument development. Analysis of TO-11A samples for the carbonyls listed in the following table (identified by footnote b) will be made available by EPA using their national contract analytical laboratory.

9.2.3 Hourly Averaged O_3

Hourly averaged ozone is already measured at Blair Street as a part of the NCore requirements and will continue.

Revised PAMS Target List[a]

from EPA Memorandum, October 2, 2017, "Additional Revisions to the Photochemical Assessment Monitoring Stations Compound Target List"

Existing Priority Compounds	Optional Compounds
1,2,3-Trimethylbenzene	1,3 Butadiene
1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
1-Butene	1-Pentene
2,2,4-Trimethylpentane	2,2-Dimethylbutane
Acetaldehyde[b]	2,3,4-Trimethylpentane
Benzene	2,3-Dimethylbutane
Cis-2-Butene	2,3-Dimethylpentane
Ethane	2,4-Dimethylpentane
Ethylbenzene	2-Methylheptane
Ethylene	2-Methylhexane
Formaldehyde[b]	2-Methylpentane
Isobutane	3-Methylheptane
Isopentane	3-Methylhexane
Isoprene	3-Methylpentane
M/P Xylene	Acetone
M-Ethyltoluene	Acetylene
N-Butane	Alpha Pinene
N-Hexane	Benzaldehyde[b]
N-Pentane	Beta Pinene
O-Ethyltoluene	Cis-2-Pentene
O-Xylene	Carbon Tetrachloride
P-Ethyltoluene	Cyclohexane
Propane	Cyclopentane
Propylene	Ethanol
Styrene	Isopropylbenzene
Toluene	M-Diethylbenzene
Trans-2-Butene	Methylcyclohexane
	Methylcyclopentane
	N-Decane
	N-Heptane
	N-Nonane
	N-Octane
	N-Propylbenzene
	N-Undecane
	P-Diethylbenzene
	Tetrachloroethylene
	Trans-2-Pentene

[a] This table only includes individual target compounds. Monitoring agencies should continue measuring and reporting total non-methane organic compounds (TNMOC)

[b] These compounds are carbonyls and are measured using Method TO-11a

9.2.4 Hourly Averaged Nitrogen Oxide (NO), True Nitrogen Dioxide (NO_2) and Total Reactive Nitrogen (NO_y)

NO and NO_y are already measured at Blair Street as a part of the NCore requirements and will continue. True NO_2 is currently measured at Blair Street using an analyzer with a photolytic NO_2 converter. This instrument will be replaced with a cavity attenuated phase shift spectroscopy (CAPS) NO/NO_2/NOx analyzer designated as FEM that will provide true NO_2 measurement as well as NO and NOx.

9.2.5-9.2.10 Hourly Averaged Ambient Temperature, Hourly Vector-Averaged Wind Direction, Hourly Vector-Averaged Wind Speed, Hourly Averaged Atmospheric Pressure, Hourly Averaged Relative Humidity, And Hourly Precipitation

Temperature, wind direction, wind speed, atmospheric pressure, and relative humidity are already measured at Blair Street and will continue. The Department will procure, install and use a precipitation measurement instrument.

9.2.11 Hourly Averaged Mixing Height

EPA plans to provide funding for procurement of a ceilometer, which is an instrument that uses a laser to measure mixing height. Based on information available at this time, the Department expects that the ceilometer to be procured, installed, and used will be a Vaisala CL-51 with appropriate software. The mixing height measurement is expected to begin in June 2021 if funds are available.

9.2.12 Hourly Averaged Solar Radiation

Solar radiation is already measured at Blair Street and will continue.

9.2.13 Hourly Averaged Ultraviolet Radiation

The Department will procure, install and use an ultraviolet radiation measurement instrument.

9.3 PAMS Implementation Schedule and Resource Requirements

The following table lists some of the major schedule elements associated with implementation of PAMS measurement and tentative starting and ending dates (month and year) for each activity. It is based on the QAIP referenced above and associated information from EPA, including information provided during regular PAMS conference calls, and includes relevant activities planned by EPA. As noted in the table, timing of some of the schedule elements, especially capital equipment acquisition, depends on availability of funding and availability of instrumentation from national contracts. This schedule reflects the delays described above and is subject to additional change as the progress of elements in the schedule continues to evolve.

Personnel resource and cost estimates for this activity are being developed by the Department and will be communicated separately to EPA Region 7 staff.

Tentative PAMS Implementation Schedule

	Start	Finish
QA Related Tasks		
EPA: PAMS TAD and Auto GC SOPs and workgroup review/iteration/comment	2/17	5/19
EPA: PAMS generic QAPP and SOPs (NO2, ceilometer, carbonyl sampling/analysis) and review/iteration/comment	7/17	5/19
EPA: PAMS proficiency testing (PT) and TSA program development and review/iteration/comment	11/17	7/19
EPA: Development of quality control/PT reports	4/18	9/19
Department: Draft PAMS QAPP and SOPs	12/17	12/20
EPA (Region VII): Review QAPP and SOPs	12/20	3/21
Department: Finalize QAPP and SOPs	3/21	5/21
EPA: TSA audit training/readiness reviews	10/18	3/21
EPA: Proficiency testing on operational sites/labs	10/18	5/21
Implementation Tasks		
Department: Implementation plan development (this plan)	1/17	6/20
Department: Personnel resource and cost estimate planning and development	1/17	12/20
Department: Continue to participate in monthly PAMS conference calls and review guidance documents as available	1/17	5/21
EPA and Department: Capital equipment acquisition from national contract (GC ; depends on EPA schedule)	11/17	12/20
Department: Other equipment and supplies acquisition (depends on funding availability)	7/19	4/21
Department: Equipment installation	1/21	4/21
Department: Equipment shakedown/testing	4/21	5/21
Department: First PAMS measurement season	6/21	8/21

Network Description/Components

See Appendix 1 for the Network Description, which includes the following components:

Site Data

All ambient air monitoring sites are recorded in the EPA's Air Quality System (AQS) database. Site data include:

AQS Site Code

The site code includes a numerical designation for state, county and individual site. The state and county codes are assigned a number based on the alphabetical order of the state or county. Site numbers are assigned sequentially by date established in most counties. St. Louis County sites also have a division for municipality within St. Louis County.

Street Address

The official post office address of the lot where the monitors are located. Because not all sites are located in cities or towns, the street address is occasionally given as the intersection of the nearest streets or highways.

Geographical Coordinates

The coordinate system used by the Department is latitude and longitude.

Air Quality Control Region

Air Quality Control Regions (AQCR) are defined by EPA and designate either urban regions, like St. Louis or Kansas City, or rural sections of a state, such as northeast or southwest Missouri.

AQCR	AQCR Name
070	Metropolitan St. Louis
094	Metropolitan Kansas City
137	Northern Missouri
138	Southeast Missouri
139	Southwest Missouri

Core Based Statistical Area

Core Based Statistical Areas (CBSA) are defined by the U.S. Census Bureau.

CBSA Code	CBSA Name
00000	Not in a CBSA
16020	Cape Girardeau-Jackson, Missouri-Illinois
17860	Columbia, Missouri
22220	Fayetteville-Springdale-Rogers, Arkansas-Missouri
27620	Jefferson City, Missouri
27900	Joplin, Missouri
28140	Kansas City, Missouri-Kansas
41140	St. Joseph, Missouri-Kansas

41180	St. Louis, Missouri-Illinois
44180	Springfield, Missouri

Monitor Data

Each monitor is designed to detect a specific chemical pollutant or group of related pollutants. A site may have one or many monitors and not all sites will have the same monitors. Monitor data include:

Pollutant

The common name of the pollutant. Criteria pollutants are defined by statute in the Clean Air Act.

AQS Pollutant Code

Each pollutant has a unique numerical code. PAMS pollutant codes are listed in the PAMS QAPP template and will be listed in the PAMS QAPP (see Section 9).

Pollutant Code	Pollutant
14129	Lead – Local Conditions (LC)
42101	Carbon Monoxide
42401	Sulfur Dioxide
42406	Sulfur Dioxide 5-minute
42600	Reactive Oxides of N (NOY)
42601	Nitric Oxide
42602	Nitrogen Dioxide
42603	Oxides of Nitrogen
44201	Ozone
61103	Resultant Wind Speed
61104	Resultant Wind Direct
62101	Outdoor Temperature
62107	Indoor Temperature
62201	Relative Humidity
63301	Solar Radiation
64101	Barometric Pressure
68105	Average Ambient Temperature
68108	Sample Barometric Pressure
81102	PM_{10}
88313	Black Carbon-LC
85101	PM_{10} – LC
85129	Lead PM10 LC - FRM/FEM
86101	PMCoarse – LC (FRM Difference)
88101	$PM_{2.5}$ FRM
88500	$PM_{2.5}$ Total Atmospheric
88502	$PM_{2.5}$ AQI/Speciation
88503	$PM_{2.5}$ Reference
61106	Sigma Theta
62106	Temperature Difference

65102	Precipitation
88314	UV Carbon $PM_{2.5}$-Local Condition
85102	Antimony
85103	Arsenic PM_{10} LC
85107	Barium PM_{10} LC
85109	Bromine PM_{10} LC
85110	Cadmium PM_{10} LC
85111	Calcium PM_{10} LC
85112	Chromium PM_{10} LC
85113	Cobalt PM_{10} LC
85114	Copper PM_{10} LC
85126	Iron PM_{10} LC
85128	Lead PM_{10} LC
85132	Manganese PM_{10} LC
85136	Nickel PM_{10} LC
85142	Mercury PM_{10} LC
85154	Selenium PM_{10} LC
85160	Tin PM_{10} LC
85161	Titanium PM_{10} LC
85164	Vanadium PM_{10} LC
85166	Silver PM_{10} LC
85167	Zinc PM_{10} LC
85173	Thallium PM_{10} LC
85180	Potassium PM_{10} LC
88160	Tin PM_{10} LC
88305	Organic Carbon Chemical Speciation Network Unadjusted $PM_{2.5}$ LC TOT
88312	Total Carbon $PM_{2.5}$ LC TOT
88316	Optical Elemental Carbon $PM_{2.5}$ LC TOT

Parameter Occurrence Code

The Parameter Occurrence Code (POC) distinguishes between different monitors for the same pollutant, most often collocated monitors used for precision and quality assurance. For $PM_{2.5}$, different parameter occurrence codes are assigned to FRM, collocated FRM, continuous and speciation monitors.

Collocated

Collocated monitors are used for precision and quality assurance activities, and for redundancy for critical pollutants such as ozone.

Sampling Frequency

Sampling frequency varies for each pollutant, depending on the nature of the NAAQS standard and the technology used in the monitoring method. Most gaseous pollutants, $PM_{2.5}$ and PM_{10} monitors use continuous monitoring FEM methods and are averaged over one hour. Some particulate pollutants are filter-based FRM methods and averaged over one day.

Scale of Representation

Each monitor is intended to represent an area with similar pollutant concentration. The scales range from only a few meters to many kilometers.

- **MIC** **Microscale** - defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.
- **MID** **Middle** - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.
- **NBR** **Neighborhood** - defines concentrations within an extended area of a city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers.
- **URB** **Urban** - defines an overall citywide condition with dimensions on the order of 4 to 50 kilometers.
- **REG** **Regional** - defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

Monitor Type/Network Affiliation

The monitor's administrative classification is determined by the purpose for the monitor in the agency sampling strategy. Assignment of monitor types “NCORE” and “PAMS” is limited to EPA headquarters and is done only after a complete review and approval for all site or monitor metadata.

Code	Description
IMPROVE	IMPROVE or IMPROVE Protocol
INDEX SITE	(not currently used by Missouri)
INDUSTRIAL	Used to indicate sites operated by an industry Primary Quality Assurance Organization (PQAO)
NATTS	National Air Toxics Trends Station
NEAR ROAD	Near Road monitoring station
NCORE	National Core monitoring station
NON-EPA FEDERAL	(not currently used by Missouri)
NON-REGULATORY	Not used for NAAQS Compliance
PAMS	Photochemical Assessment Monitoring Stations
PROPOSED NCORE	Proposed NCore
QA COLLOCATED	Collocated to Satisfy 40 CFR 58 Appendix A
SLAMS	State or Local Air Monitoring Station
SPECIAL PURPOSE	Special Purpose Monitoring Station (SPM or SPMS)
SUPLMNTL SPECIATION	Supplemental Speciation
TRENDS SPECIATION	Trends Speciation
TRIBAL MONITORS	(not currently used by Missouri)
UNOFFICIAL PAMS	(not currently used by Missouri)

State Monitoring Objective

Each monitor has a distinct objective such as providing real-time data for public awareness or use in determining compliance with regulations. The state monitoring objective provides more information about the purpose of the monitoring in addition to the monitor objective required of 40 CFR 58.10(a)(6).

State Objective Code	Objective
AQI	Public Information
COM	NAAQS Compliance
MET	Meteorological Data
RES	Research
SIP	State Implementation Plan
SPP	Special Purpose Project
STA	State Standard

Units

The physical terms used to quantify the pollutant concentration, such as parts per million or micrograms per cubic meter.

Unit Code	Unit Description
001	$\mu g/m^3$
007	parts per million
008	parts per billion
011	meters per second
012	miles per hour
013	knots
014	degree, compass
015	degree Fahrenheit
016	millibars
017	degree Celsius
018	Langleys
019	percent humidity
021	inches
022	inches Mercury
025	Langleys per minute
059	Millimeter (Mercury)
073	Liters/minute STP-Flow
077	Micrograms
079	$Watts/m^2$
083	Cubic meter/minute
105	$\mu g/m^3$ LC
106	Minutes
107	Percent
118	Liters/minute LC-Flow
119	Cubic meters/minute LC-Flow
121	parts per trillion

Monitoring/Analytical Method

Each monitor relies on a scientific principle to determine the pollutant concentration, which is described by the sampling method. Each method code is specific for a particular pollutant; therefore a three numeral code may be used for different methods for different pollutants. This is required by 40 CFR 58.10(a)(3).

Monitoring Objective

This is the primary monitoring objective(s) for the monitoring parameter required by 40 CFR 58.10(a)(6). The monitoring objective is specific to the pollutant. Some sites may have more than one monitoring objective, but the primary objective is listed first.

Appendix 1: Missouri Monitoring Network Description

Missouri Ambient Air Monitoring Network

MIC	***Microscale***	***Several meters up to about 100 meters***
MID	***Middle***	***100 meters to 0.5 kilometer***
NBR	***Neighborhood***	***0.5 to 4.0 kilometers range***
URB	***Urban***	***4 to 50 kilometers***
REG	***Regional***	***Tens to hundreds of kilometers***
COM	***National Ambient Air Quality Standards (NAAQS) Compliance***	
MET	***Meteorological Data***	
N/A	***Not Applicable***	
NCore	***National Multi-Pollutant Monitoring Stations***	
NON-A	***Non-Ambient Site***	
NON-R	***Non-Regulatory***	
PQAO	***Primary Quality Assurance Organization***	
RES	***Research***	
SLAMS	***State and Local Monitoring Stations***	
SIP	***State Implementation Plan***	
SPEC	***Speciation***	
STA	***State Standard***	
SPM	***Special Purpose Monitoring***	
SPP	***Special Purpose Project***	
Coll	***Collocated monitor. A secondary monitor at a site.***	

Ameren Missouri (PQAO - 1440)

Labadie "Plant" Site — *AQS Site Number* 29-071-9003

~1.5 km south of the Labadie Energy Center, Labadie, MO 63055

Latitude: 38.5486 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.83725 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 680

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m - 300m)
Temperature Virtual	62102	Industrial	1	☐	1	N/A	MET	017	deg C	128	Scintec MFAS Sodar/RASS Radar Profiler	Other (40m - 300m)
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m - 300m)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m - 300m)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	127	Scintec MFAS Sodar/RASS Acoustic Sounder	Other (40m - 300m)

Labadie, North

AQS Site Number 29-183-9004

~150 ft. north of Terry Rd and ~200 ft. Kingfisher Ct, Augusta, MO 63332

Latitude: 38.59557 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.82864 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 816

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Labadie, Northwest

AQS Site Number 29-183-9002

Rt. 94, Augusta, MO 63332 near the intersection with Schluersburg Road

Latitude: 38.5818 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.865528 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 550

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Heights)

Relative Humidity	62201	Industrial	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	Other
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (10m Tower)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (10m Tower)
Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (10m Tower)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (10m Tower)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (10m Tower)

Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (10m Tower)

Labadie, Southwest — *AQS Site Number* 29-071-9002

870 Albertina Lane, Labadie, MO 63055

Latitude: 38.52825 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.86301 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 630

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Labadie, Valley Site — *AQS Site Number* 29-071-9001

2901 Labadie Bottom Road, Labadie, MO 63055

Latitude: 38.572522 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.796911 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 525

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	Industrial	1	☐	1	N/A	MET	016	Millbars	015	Instrumental-Barometric Press Transducer	Other

Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Heights)
Precipitation	65102	Industrial	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	Industrial	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	Other
Solar Radiation	63301	Industrial	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (10m Tower)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (10m Tower)
Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (10m Tower)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (10m Tower)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (10m Tower)
Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (10m Tower)

Rush Island, Fults-Site, IL — *AQS Site Number* 17-133-9001

Off Ivy Road, Fults, IL 62244

Latitude: 38.15908 ***AQCR:*** 138 SE Missouri

Longitude: -90.22728 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 446

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Barometric Pressure	64101	Industrial	1	☐	1	N/A	MET	016	Millbars	015	Instrumental-Barometric Press Transducer	Other
Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Heights)
Precipitation	65102	Industrial	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	Industrial	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	Other
Solar Radiation	63301	Industrial	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (10m Tower)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)

Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (10m Tower)
Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (10m Tower)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (10m Tower)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (10m Tower)
Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (10m Tower)

Rush Island, Johnson Tall Tower — AQS Site Number 29-099-9008

600 Johnson Rd., Festus, MO 63028

Latitude: 38.11999 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.28214 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 656

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Outdoor Temperature	62101	Industrial	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (62.5m Probe Height)
Outdoor Temperature	62101	Industrial	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (132.5m Probe Height)
Outdoor Temperature Diff	62106	Industrial	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (132.5m-62.5m Probe Heights)
Std Dev Hz Wind Direction	61106	Industrial	1	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (132.5m, 15 min)
Std Dev Hz Wind Direction	61106	Industrial	2	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (132.5m, 60 min)
Std Dev Hz Wind Direction	61106	Industrial	3	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, A-15 min)
Std Dev Hz Wind Direction	61106	Industrial	4	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, A-60 min)
Std Dev Hz Wind Direction	61106	Industrial	5	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, B-15 min)

Std Dev Hz Wind Direction	61106	Industrial	6	☐	1	N/A	MET	014	deg	063	Arithmetic Standard Deviation	Other (62.5m, B-60 min)
Std Dev Vt Wind Direction	61107	Industrial	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (132.5m, 15 min)
Std Dev Vt Wind Direction	61107	Industrial	2	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (132.5m, 60min)
Std Dev Vt Wind Direction	61107	Industrial	3	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, A-15 min)
Std Dev Vt Wind Direction	61107	Industrial	4	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, A-60min)
Std Dev Vt Wind Direction	61107	Industrial	5	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, B-15 min)
Std Dev Vt Wind Direction	61107	Industrial	6	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (62.5m, B-60 min)
Wind Direction - Resultant	61104	Industrial	1	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (132.5m Probe Height)
Wind Direction - Resultant	61104	Industrial	2	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (62.5m Probe Height)
Wind Direction - Resultant	61104	Industrial	3	☐	1	N/A	MET	014	deg	020	Vector Summation	Other (62.5m Probe Height)

Wind Direction - Scalar	61102	Industrial	1	☐	1	N/A	MET	014	deg	063	Climatronics	Other (132.5m Probe Height)
Wind Direction - Scalar	61102	Industrial	2	☐	1	N/A	MET	014	deg	063	Climatronics	Other (62.5m Probe Height)
Wind Direction - Scalar	61102	Industrial	3	☐	1	N/A	MET	014	deg	063	Climatronics	Other (62.5m Probe Height)
Wind Speed - Resultant	61103	Industrial	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (132.5m Probe Height)
Wind Speed - Resultant	61103	Industrial	2	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (62.5m Probe Height)
Wind Speed - Resultant	61103	Industrial	3	☐	1	N/A	MET	011	m/s	020	Vector Summation	Other (62.5m Probe Height)
Wind Speed - Scalar	61101	Industrial	1	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (132.5m Probe Height)
Wind Speed - Scalar	61101	Industrial	2	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (62.5m Probe Height)
Wind Speed - Scalar	61101	Industrial	3	☐	1	N/A	MET	011	m/s	063	Climatronics	Other (62.5m Probe Height)
Wind Speed - Vertical	61109	Industrial	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (132.5m Probe Height)

Wind Speed - Vertical	61109	Industrial	2	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (62.5m Probe Height)
Wind Speed - Vertical	61109	Industrial	3	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	Other (62.5m Probe Height)
WS - Sigma Theta (Vertical)	61110	Industrial	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (132.5m Probe Height)
WS - Sigma Theta (Vertical)	61110	Industrial	2	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (62.5m Probe Height)
WS - Sigma Theta (Vertical)	61110	Industrial	3	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	Other (62.5m Probe Height)

Rush Island, Natchez — *AQS Site Number* 29-099-9009

917 Natchez Trace Drive, Bloomsdale, MO 63627

Latitude: 38.10525 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.29842 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 505

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Rush Island, Weaver Road & Highway AA

AQS Site Number 29-099-9007

802 Weaver Road, Festus, MO 63028

Latitude:	38.144972	***AQCR:***	070	Metropolitan St. Louis
Longitude:	-90.304783	***MSA:***	7040	St. Louis, MO-IL
Elevation (ft):	502			

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	100	Ultra-violet Fluorescence	Source Oriented

Doe Run Buick (PQAO - 1288) (Combining all Doe Run to 1290)

County Road 75 — *AQS Site Number* 29-093-9010

98 Iron County Road, Bixby, MO 65439

Latitude: 37.64876 ***AQCR:*** 138 SE Missouri

Longitude: -91.14980 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1365

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Doe Run Buick - Buick NE — *AQS Site Number* 29-093-9008

346 Power Lane, Bixby West, MO 65439

Latitude: 37.65214 ***AQCR:*** 138 SE Missouri

Longitude: -91.11689 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1423

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/1	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented

Doe Run Buick - North #5 (NON-A)

***AQS Site Number*29-093-0021**

Doe Run Buick - North#5, Buick, MO 65439

Latitude: 37.65178 ***AQCR:*** 138 SE Missouri

Longitude: -91.13094 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1443

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented

Doe Run Buick - South #1 (NON-A)

***AQS Site Number*29-093-0016**

Doe Run Buick - South#1, Buick, MO 65439

Latitude: 37.62400 ***AQCR:*** 138 SE Missouri

Longitude: -91.12827 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1502

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☑	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Quality Assurance (Collocation)

Hwy 32 Northeast

***AQS Site Number*29-093-9009**

1582 Highway 32, Bixby, MO 65439

Latitude: 37.65319 ***AQCR:*** 138 SE Missouri

Longitude: -91.12795 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1384

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

West Entrance — *AQS Site Number* 29-093-9011

18594 Hwy KK, Boss, MO 65440

Latitude: 37.63211 ***AQCR:*** 138 SE Missouri

Longitude: -91.13565 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1463

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Doe Run Glover (PQAO - 1289) (Combining all Doe Run to 1290)

Doe Run Glover - Big Creek #5 (NON-A)

AQS Site Number **29-093-0029**

Doe Run Glover - Big Creek #5, Hwy 49 Glover, MO 65439

Latitude: 37.47211 ***AQCR:*** 138 SE Missouri

Longitude: -90.68919 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 836

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented

Doe Run Glover - Post Office #2 (NON-A)

AQS Site Number **29-093-0027**

Doe Run Glover - Post Office #2, Hwy 49 Glover, MO 65439

Latitude: 37.48532 ***AQCR:*** 138 SE Missouri

Longitude: -90.68991 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 831

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☑	1/6	MID	SIP	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Quality Assurance (Collocation)

Doe Run Herculaneum (PQAO - 1290) (No Change)

Herculaneum, Church Street (NON-A) — *AQS Site Number* 29-099-0024

951 Church St., Herculaneum, MO 63048

Latitude: 38.258667 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.380889 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 463

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented

Herculaneum, City Hall (Mott Street) — *AQS Site Number* 29-099-0020

360 Short Street, Herculaneum, MO, 63048

Latitude: 38.263394 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.379667 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 468

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/1	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☑	1/3	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Quality Assurance (Collocation)

Herculaneum, Dunklin High School (Combined) — AQS Site Number 29-099-0005

1 Black Cat Dr., Herculaneum, MO, 63048

Latitude:	38.26703	**AQCR:**	070	Metropolitan St. Louis
Longitude:	-90.37875	**MSA:**	7040	St. Louis, MO-IL
Elevation (ft):	445			

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☐	1/3	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Population Exposure

Herculaneum, North Cross — AQS Site Number 29-099-0023

North Cross, Herculaneum, MO 63048

Latitude:	38.26216	**AQCR:**	070	Metropolitan St. Louis
Longitude:	-90.38126	**MSA:**	7040	St. Louis, MO-IL
Elevation (ft):	463			

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/3	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Population Exposure

Environmental Services Program (ESP) [PQAO - 0588]

Alba — AQS Site Number 29-097-0004

20400 Millwood Rd., Alba, MO 64830

Latitude: 37.2385 ***AQCR:*** 139 SW Missouri

Longitude: -94.42468 ***MSA:*** 3710 Joplin, MO

Elevation (ft): 965

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Arnold West — AQS Site Number 29-099-0019

1709 Lonedell Dr., Arnold, MO 63010

Latitude: 38.44862 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.3958 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 639

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Ammonium Ion PM2.5 LC	88301	SLAMS	6	☐	1/6	NBR	RES	105	ug/m^3-LC	812	Met One SASS Nylon	Population Exposure (UC-Davis)

Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
OP CSN_Rev Undj PM2.5 LC TOR	88378	SLAMS	6	☐	1/6	NBR	RES	105	ug/m^3-LC	842	URG 3000N w/Pall Quartz filter & Cyclone Inlet	Population Exposure (UC-Davis)
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SPM	4	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure

Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	Other (10m Tower)

Blair Street (86101-2 & 81102-1 to be discontinued) *AQS Site Number* **29-510-0085**

3247 Blair Street, St. Louis, MO 63107

Latitude: 38.65638 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.19825 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 492

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Ammonium Ion PM2.5 LC	88301	SPM	6	☐	1/3	NBR	RES	105	ug/m^3-LC	812	Met One SASS Nylon	Highest Concentration (UC-Davis)
Barometric Pressure	64101	SLAMS	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Black Carbon PM2.5 LC	88313	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Population Exposure
Carbon Monoxide	42101	NCORE	1	☐	H	NBR	COM	007	ppm	554	Gas Filter Corr Thermo Electron 48i TLE	Population Exposure

Indoor Temperature	62107	SLAMS	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other (Large Shelter)
Indoor Temperature	62107	SLAMS	2	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other (Small Shelter)
Lead PM10 LC	85128	SPM	6	☐	1/6	NBR	RES	108	ng/m^3-LC	907	R&P Partisol 2025 Teflon	Population Exposure (ERG)
Lead PM10 LC	85128	SPM	7	☑	1/6	NBR	RES	108	ng/m^3-LC	907	R&P Partisol 2025 Teflon	Population Exposure (ERG)
Nitric Oxide	42601	NCORE	1	☐	H	NBR	COM	008	ppb	699	Teledyne API 200 EU/501	Population Exposure
Nitric Oxide	42601	SLAMS	2	☐	H	NBR	COM	008	ppb	200	Teledyne API T200UP Photolytic	Population Exposure
Nitrogen Dioxide	42602	SLAMS	2	☐	H	NBR	COM	008	ppb	200	Teledyne API T200UP Photolytic	Population Exposure
OP CSN_Rev Undj PM2.5 LC TOR	88378	SPM	6	☐	1/3	NBR	RES	105	ug/m^3-LC	842	URG 3000N w/Pall Quartz filter & Cyclone Inlet	Highest Concentration (UC-Davis)
Outdoor Temperature	62101	NCORE	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Oxides of Nitrogen	42603	SLAMS	2	☐	H	NBR	COM	008	ppb	200	Teledyne API T200UP Photolytic	Population Exposure

Ozone	44201	NCORE	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	NCORE	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC/FEM/NonFEM	85101	SLAMS	1	☐	1/3	NBR	COM	105	ug/m^3-LC	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - LC/FEM/NonFEM	85101	SLAMS	5	☐	1	NBR	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM10 - LC/FEM/NonFEM	85101	SPM	6	☐	H	NBR	COM	105	ug/m^3-LC	239	Teledyne API T640x	Population Exposure
PM10 - LC/FEM/NonFEM	85101	SPM	7	☑	H	NBR	COM	105	ug/m^3-LC	239	Teledyne API T640x	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	1	☐	1/3	NBR	COM	001	ug/m^3	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - STP FRM/FEM	81102	SPM	6	☐	H	NBR	COM	001	ug/m^3	239	Teledyne API T640x	Population Exposure
PM10 - STP FRM/FEM	81102	SPM	7	☑	H	NBR	COM	001	ug/m^3	239	Teledyne API T640x	Population Exposure
PM2.5 - LC FRM/FEM	88101	NCORE	2	☐	1/3	NBR	COM	105	ug/m^3-LC	145	R&P 2025 Sequential w/VSCC	Quality Assurance (Collocation)

PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SPM	6	☐	H	NBR	COM	105	ug/m^3-LC	238	Teledyne API T640x	Population Exposure
PM2.5 - LC FRM/FEM	88101	SPM	7	☑	H	NBR	COM	105	ug/m^3-LC	238	Teledyne API T640x	Population Exposure
PM2.5 Tot Atmospheric	88500	SLAMS	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SLAMS	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	2	☐	1/3	NBR	COM	105	ug/m^3-LC	176	Thermo 2025 Sequential PM10-PM2.5	Population Exposure
PMCoarse - LC FRM/FEM	86101	SPM	6	☐	H	NBR	COM	105	ug/m^3-LC	240	Teledyne API T640x	Population Exposure
PMCoarse - LC FRM/FEM	86101	SPM	7	☑	H	NBR	COM	105	ug/m^3-LC	240	Teledyne API T640x	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Reactive Oxides of N (NOY)	42600	NCORE	1	☐	H	NBR	COM	008	ppb	699	Teledyne API 200 EU/501	Population Exposure

Relative Humidity	62201	NCORE	1	☐	1	N/A	MET	019	%humidity	014	Instrumental-Hygromer C94 Probe	Other
Solar Radiation	63301	SLAMS	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Sulfur Dioxide	42401	NCORE	1	☐	H	NBR	COM	008	ppb	560	Pulsed Flourescent 43i-TLE	Population Exposure
Sulfur Dioxide Max 5-min Avg	42406	NCORE	1	☐	1	NBR	COM	008	ppb	560	Pulsed Fluorescent	Population Exposure
UV Carbon PM2.5 LC	88314	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Population Exposure
Wind Direction - Resultant	61104	NCORE	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	NCORE	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Blue Ridge, I-70 — AQS Site Number 29-095-0042

4018 Harvard Lane, Kansas City, MO 64133

Latitude: 39.047911 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.450513 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 960

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Black Carbon PM2.5 LC	88313	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Carbon Monoxide	42101	SLAMS	1	☐	H	MIC	COM	007	ppm	554	Gas Filter Corr Thermo Electron 48i TLE	Source Oriented
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)

Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other
Oxides of Nitrogen	42603	SPM	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
PM10 - LC/FEM/NonFEM	85101	SPM	5	☐	1	MIC	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	MIC	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PM2.5 Volatile Channel	88503	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Source Oriented

Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
UV Carbon PM2.5 LC	88314	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Bonne Terre *AQS Site Number* 29-186-0005

15797 Highway D, Bonne Terre, MO 63628

Latitude: 37.90084 ***AQCR:*** 138 SE Missouri

Longitude: -90.42388 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 840

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	Regional Transport
Ozone	44201	SLAMS	2	☑	1	REG	COM	007	ppm	047	Ultraviolet Photometric	-
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other

Branch Street — *AQS Site Number* 29-510-0093

100 Branch St., St. Louis, MO 63102

Latitude: 38.65643 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.18977 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 429

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)

PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	MID	COM	001	ug/m^3	239	Teledyne API T640x	Source Oriented
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	MID	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Source Oriented
PM2.5 Volatile Channel	88503	SPM	4	☐	1	MID	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Source Oriented
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Buick NE *AQS Site Number* 29-093-0034

346 Power Lane, Bixby West, MO 65439

Latitude: 37.65212 ***AQCR:*** 138 SE Missouri

Longitude: -91.11653 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1423

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	SLAMS	2	☑	1/6	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Quality Assurance (Collocation)
Sulfur Dioxide	42401	SPM	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10 meters)

Carthage — *AQS Site Number* 29-097-0003

530 Juniper, Carthage, MO 64836

Latitude: 37.19822 ***AQCR:*** 139 SW Missouri

Longitude: -94.31702 ***MSA:*** 3710 Joplin, MO

Elevation (ft): 986

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	MID	COM	001	ug/m^3	079	R&P SA246B TEOM	Source Oriented
PM10 - STP FRM/FEM	81102	SLAMS	4	☑	1	MID	COM	001	ug/m^3	079	R&P SA246B TEOM	Quality Assurance (Collocation)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (5.5 meters)

El Dorado Springs — *AQS Site Number* 29-039-0001

Highway 97 & Barnes Road, El Dorado Springs, MO 64744

Latitude: 37.70097 ***AQCR:*** 139 SW Missouri

Longitude: -94.03474 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 965

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	Regional Transport
Ozone	44201	SLAMS	2	☑	1	REG	COM	007	ppm	047	Ultraviolet Photometric	-
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	REG	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Regional Transport
PM2.5 Volatile Channel	88503	SPM	4	☐	1	REG	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Regional Transport
Relative Humidity	62201	SPM	2	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	Other (5.5 meters)

Farrar

AQS Site Number 29-157-0001

County Rd. 342, Farrar, MO 63746

Latitude: 37.70264 ***AQCR:*** 138 SE Missouri

Longitude: -89.698640 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 497

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Fellows Lake

AQS Site Number 29-077-0042

4208 E. Farm Rd. 66, Springfield, MO 65803

Latitude: 37.31912 ***AQCR:*** 139 SW Missouri

Longitude: -93.20422 ***MSA:*** 7920 Springfield, MO

Elevation (ft): 1346

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure

Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-

Finger Lakes — AQS Site Number 29-019-0011

1505 E. Peabody Road, Columbia, MO 65202

Latitude: 39.07803 ***AQCR:*** 137 Northern Missouri

Longitude: -92.31632 ***MSA:*** 1740 Columbia, MO

Elevation (ft): 726

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Fletcher — AQS Site Number 29-179-0002

Forest Rd. 2236, Westfork, MO 64498

Latitude: 37.46889 ***AQCR:*** 138 SE Missouri

Longitude: -91.08847 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1256

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Foley West

AQS Site Number 29-113-0004

2100 Highway Y Foley, MO 63347

Latitude: 39.04577 ***AQCR:*** 137 Northern Missouri

Longitude: -90.84927 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 715

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Forest City, Exide Levee

AQS Site Number 29-087-0008

25942 Hwy 111, Forest City, MO 64451

Latitude: 40.027222 ***AQCR:*** 137 Northern Missouri

Longitude: -95.235833 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 904

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Forest Park — AQS Site Number 29-510-0094

5600 Clayton Avenue, St. Louis, MO 63110

Latitude: 38.63114 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.28115 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 551

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Black Carbon PM2.5 LC	88313	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Carbon Monoxide	42101	SLAMS	1	☐	H	MIC	COM	007	ppm	554	Gas Filter Corr Thermo Electron 48i TLE	Source Oriented
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)

Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Height)
Oxides of Nitrogen	42603	SPM	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
PM10 - LC/FEM/NonFEM	85101	SPM	5	☐	1	MIC	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	MIC	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PM2.5 Volatile Channel	88503	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Source Oriented

Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SLAMS	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
UV Carbon PM2.5 LC	88314	SPM	1	☐	1	MIC	COM	105	ug/m^3-LC	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Front Street *AQS Site Number* 29-095-0018

1331 N. Jackson, Kansas City, MO 64120

Latitude: 39.13198 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.52137 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 728

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Highest Concentration & Population Exposure

Herculaneum, Dunklin High School (Combined) — *AQS Site Number* 29-099-0005

1 Black Cat Dr., Herculaneum, MO, 63048

Latitude: 38.26703 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37875 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 445

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Herculaneum, Mott Street — *AQS Site Number* 29-099-0027

747 Mott St., Herculaneum, MO, 63048

Latitude: 38.263394 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.379667 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 468

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/1	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented & Highest Concentration

Lead (TSP) - LC FRM/FEM	14129	SLAMS	2	☑	1/3	MID	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Quality Assurance (Collocation)
Sulfur Dioxide	42401	SLAMS	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented & Highest Concentration
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented & Highest Concentration
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	Other (5.5 meters)

Herculaneum, Sherman — *AQS Site Number* **29-099-0013**

460 Sherman St., Herculaneum, MO, 63048

Latitude: 38.27170 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37658 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 462

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Hillcrest High School

AQS Site Number 29-077-0036

3319 N. Grant, Springfield, MO 65803

Latitude: 37.25607 ***AQCR:*** 139 SW Missouri

Longitude: -93.29970 ***MSA:*** 7920 Springfield, MO

Elevation (ft): 1321

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC/FEM/NonFEM	85101	SPM	5	☐	1	NBR	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure

PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	APM	1	☐	H	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

Ladue — *AQS Site Number* 29-189-3001

73 Hunter Ave., Ladue, MO 63124

Latitude: 38.65028 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.35021 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 511

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
PM2.5 - LC FRM/FEM	88101	SLAMS	2	☑	1/6	NBR	COM	105	ug/m^3-LC	145	R&P 2025 Sequential w/VSCC	Quality Assurance (Collocation)
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

Liberty — *AQS Site Number* 29-047-0005

Highway 33 & County Home Rd., Liberty, MO 64068

Latitude: 39.30314 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.37678 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 941

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC/FEM/NonFEM	85101	SPM	5	☐	1	NBR	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other

Mark Twain State Park

AQS Site Number 29-137-0001

20057 State Park Office Rd., Stoutsville, MO 65283

Latitude: 39.47510 ***AQCR:*** 137 Northern Missouri

Longitude: -91.78899 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 710

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	H	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Nitrogen Dioxide	42602	SPM	1	☐	H	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Oxides of Nitrogen	42603	SPM	1	☐	H	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	General/Background
Ozone	44201	SLAMS	2	☑	1	REG	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - STP FRM/FEM	81102	SPM	3	☐	1	REG	SIP	001	ug/m^3	079	R&P SA246B TEOM	General/Background

Sulfur Dioxide	42401	SPM	1	☐	H	REG	SIP	008	ppb	060	Pulsed Fluorescent	General/Background
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	General/Background
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Maryland Heights — *AQS Site Number* **29-189-0014**

13044 Marine Ave., Maryland Heights, MO 63146

Latitude: 38.71085 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.47606 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 607

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

New Bloomfield — *AQS Site Number* 29-027-0002

2625 Meadow Lake View, New Bloomfield, MO, 65063

Latitude: 38.70608 ***AQCR:*** 137 Northern Missouri

Longitude: -92.09308 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 860

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Oates — *AQS Site Number* 29-179-0034

13155 Highway KK, Boss, MO 65440

Latitude: 37.56485 ***AQCR:*** 138 SE Missouri

Longitude: -91.11423 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1134

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

Orchard Farm — AQS Site Number 29-183-1004

2165 Highway V, St. Charles, MO 63301

Latitude: 38.8994 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.44917 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 441

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-

Pacific — AQS Site Number 29-189-0005

18701 Old Highway 66, Pacific, MO 63069

Latitude: 38.49011 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.70509 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 524

Parameter	AQS Code	AQS Monitor Type	AQS POC	Coll	AQS Freq	AQS Scale	State-Obj	AQS Unit-Code	AQS Unit	AQS Method Code	AQS Method	AQS Monitor Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure

Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Richards Gebaur-South — *AQS Site Number* 29-037-0003

1802 E. 203rd Street, Belton, MO, 64012

Latitude: 38.75961 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.57983 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1082

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC/FEM/NonFEM	85101	SPM	5	☐	1	NBR	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure

PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	Other (10m Tower)

Rider Trail, I-70 — *AQS Site Number* 29-189-0016

13080 Hollenberg Drive, Bridgeton, MO 63044

Latitude: 38.75264 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.44884 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 515

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	Other (10m - 2m Probe Height)
Oxides of Nitrogen	42603	SPM	1	☐	H	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Std Dev Hz Wind Direction	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	Other (10m Tower)
Sulfur Dioxide	42401	SPM	1	☐	H	MID	SPP	008	ppb	060	Pulsed Fluorescent	Population Exposure
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	SPP	008	ppb	060	Pulsed Fluorescent	Population Exposure
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	Other (10m Tower)

Rocky Creek — *AQS Site Number* 29-047-0006

2-114 NW 132 St., Kansas City, MO 64165

Latitude: 39.33181 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.58069 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 990

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Savannah — *AQS Site Number* **29-003-0001**

11796 Highway 71, Savannah, MO 64485

Latitude: 39.9544 ***AQCR:*** 137 Northern Missouri

Longitude: -94.849 ***MSA:*** 7000 St. Joseph, MO

Elevation (ft): 1120

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

South Broadway — *AQS Site Number* **29-510-0007**

8227 South Broadway, St. Louis, MO 63111

Latitude: 38.5425 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.263611 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 452

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*

Barometric Pressure	64101	SLAMS	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 Volatile Channel	88503	SPM	4	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

St. Joe State Park — *AQS Site Number* 29-187-0007

2800 Pimville Rd., Park Hills, MO 63601

Latitude: 37.81413 ***AQCR:*** 138 SE Missouri

Longitude: -90.50738 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 937

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	SPM	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented

St. Joseph Pump Station — AQS Site Number 29-021-0005

S. Highway 759, St. Joseph, MO 64501

Latitude: 39.741667 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.858333 ***MSA:*** 7000 St. Joseph, MO

Elevation (ft): 845

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Barometric Pressure	64101	SPM	2	☑	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Outdoor Temperature	62101	SPM	2	☑	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
PM10 - LC/FEM/NonFEM	85101	SPM	5	☐	1	NBR	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM10 - LC/FEM/NonFEM	85101	SPM	6	☑	1	NBR	COM	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Quality Assurance (Collocation)

PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	5	☑	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Quality Assurance (Collocation)
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	2	☑	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Quality Assurance (Collocation)
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	2	☑	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Quality Assurance (Collocation)
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Relative Humidity	62201	SPM	2	☑	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	Other (5.5 meters)

Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	Other (5.5 meters)

Trimble — *AQS Site Number* 29-049-0001

7536 SW. O Highway, Trimble, MO 64492

Latitude: 39.53063 ***AQCR:*** 137 Northern Missouri

Longitude: -94.55594 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1033

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration
Ozone	44201	SLAMS	2	☑	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	-

Troost — *AQS Site Number* 29-095-0034

724 Troost (Rear), Kansas City, MO 64106

Latitude: 39.10463 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.57040 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 941

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	Other

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Nitric Oxide	42601	SPM	1	☐	H	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure
Nitrogen Dioxide	42602	SLAMS	1	☐	H	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other (4m Probe Height)
Oxides of Nitrogen	42603	SPM	1	☐	H	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure
PM10 - STP FRM/FEM	81102	SPM	6	☐	H	NBR	COM	001	ug/m^3	239	Teledyne API T640x	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	H	NBR	COM	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure
PM2.5 - LC FRM/FEM	88101	SPM	6	☐	H	NBR	COM	105	ug/m^3-LC	238	Teledyne API T640x	Population Exposure
PM2.5 Volatile Channel	88503	SPM	4	☐	1	NBR	AQI	105	ug/m^3-LC	181	PM2.5 VSCC FEM or Thermo Scientific 1405-F	Population Exposure

Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other
Sulfur Dioxide	42401	SLAMS	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	SLAMS	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Ursuline North — *AQS Site Number* 29-099-0025

210 Glennon Heights Rd., Crystal City, MO 63019

Latitude: 38.243 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37372 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 578

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	813	Inductively Coupled Plasma Mass Spectroscopy	Source Oriented & Upwind Background

Watkins Mill State Park — *AQS Site Number* 29-047-0003

Watkins Mill Road, Lawson, MO 64062

Latitude: 39.40770 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.26539 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1009

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other

Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-

West Alton — *AQS Site Number* 29-183-1002

General Elecric Store, Highway 94, West Alton, MO 63386

Latitude: 38.8725 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.226389 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 425

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	COM	007	ppm	047	Ultraviolet Photometric	-
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	Other

Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	Other (10m Tower)

Magnitude 7 Metals (PQAO - 2368)

Magnitude 7 Metals, Site # 1 AECI Water Tower Location — AQS Site Number 29-143-9001

391 St Jude Industrial Park, New Madrid, MO 63869

Latitude: 36.51364 ***AQCR:*** 138 SE Missouri

Longitude: -89.56093 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 297

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	Industrial	1	☐	1	MID	MET	017	deg C	013	Electronic Averaging	Other
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Magnitude 7 Metals, Site # 2 East Graveyard — AQS Site Number 29-143-9002

391 St Jude Industrial Park, New Madrid, MO 63869

Latitude: 36.50838 ***AQCR:*** 138 SE Missouri

Longitude: -89.56074 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 296

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	Industrial	1	☐	1	MID	MET	017	deg C	013	Electronic Averaging	Other

Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Magnitude 7 Metals, Site # 3 West Entrance *AQS Site Number* **29-143-9003**

391 St Jude Industrial Park, New Madrid, MO 63869

Latitude: 36.50899 ***AQCR:*** 138 SE Missouri

Longitude: -89.57099 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 298

Parameter	*AQS Code*	*AQS Monitor Type*	*AQS POC*	*Coll*	*AQS Freq*	*AQS Scale*	*State-Obj*	*AQS Unit-Code*	*AQS Unit*	*AQS Method Code*	*AQS Method*	*AQS Monitor Objective*
Indoor Temperature	62107	Industrial	1	☐	1	MID	MET	017	deg C	013	Electronic Averaging	Other
Sulfur Dioxide	42401	Industrial	1	☐	H	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Wind Direction - Resultant	61104	Industrial	1	☐	1	MID	MET	014	deg	065	Instrumental: RM Young Model 05305	Other
Wind Speed - Resultant	61103	Industrial	1	☐	1	MID	MET	011	m/s	065	Instrumental: RM Young Model 05305	Other

Appendix 2: Comments on Proposed 2020 Monitoring Network Plan, Responses to Comments, and Corrections

The comment reproduced on the following pages was received from the Interdisciplinary Environmental Clinic, Washington University School of Law, submitted on behalf of the Sierra Club. The Department's response and identification of minor corrections to the plan (unrelated to the comment) follow the comment.

Washington University in St. Louis
SCHOOL OF LAW

Interdisciplinary Environmental Clinic

August 14, 2020

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: 2020 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 2020 Monitoring Network Plan to include a new sulfur dioxide ("SO_2") ambient air monitoring site southeast of the Labadie Energy Center in Franklin County. The purpose of the SO_2 monitoring network around Labadie is to provide sufficient information to determine whether the area, which the U.S. Environmental Protection Agency ("EPA") designated as unclassifiable for the 2010 1-hour SO_2 National Ambient Air Quality Standard ("NAAQS") in 2016,[1] is attaining that standard. As explained below, the current network is insufficient for this task.

As explained in greater detail in Sierra Club's recent comments on DNR's proposed request to redesignate the Labadie unclassifiable area to attainment under the 2010 SO_2 NAAQS, which are attached as Exhibit 1 and hereby incorporated by reference, the current SO_2 monitoring network around Labadie leaves a significant data gap that must be filled before the area's attainment status can be determined. Modeling performed by Ameren in 2016 using the limited on-site meteorological data available at the time indicated that peak 1-hour SO_2 concentrations were expected to occur southeast of the plant. Per EPA, on-site meteorological data are "the most valuable data for [monitoring site evaluations]" and "provide the best information to understand the actual conditions in which SO_2 emissions are being dispersed."[2] Hence, Ameren's 2016 modeling provided the best estimate of peak SO_2 concentration areas around the Labadie plant available at that time. Ameren's own evaluation of its 2016 modeling identified the area southeast of the plant as a "preferred monitoring location," along with an area to the southwest.[3]

[1] EPA, Air Quality Designations for the 2010 Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard—Round 2, 81 Fed. Reg. 45039 (July 12, 2016).
[2] EPA, SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document (Feb. 2016, Draft) at 6.
[3] DNR, 2016 Monitoring Network Plan, Revision 1 (Nov. 15, 2016) 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.")

However, DNR only required Ameren to install a monitor southwest of the plant when it expanded the Labadie monitoring network in late 2016.

Since that time, Ameren has collected a great deal more on-site meteorological data. The data from the meteorological monitoring station at the Northwest monitoring site, which are most representative of winds at stack height and therefore best approximate the direction of plume transport, show that winds were most frequently from the northwest during the 2017-2019 period. This indicates that the Labadie plume was transported to the southeast more frequently than in any other direction over the past three years. This validates the results of Ameren's 2016 modeling and reaffirms the need for a monitor southeast of the plant. Without a monitor in this critical location, DNR lacks data from what is most likely the point of maximum SO_2 impacts around the Labadie plant. So long as this data gap remains, DNR will not have sufficient information to determine whether the Labadie area is attaining the 2010 SO_2 NAAQS, regardless of what the existing monitors show.

Sincerely yours,

Elizabeth Hubertz, Director
Kenneth Miller, P.G., Environmental Scientist
Interdisciplinary Environmental Clinic
Washington University School of Law
One Brookings Drive – CB 1120
St. Louis, MO 63130
314-935-8760
ejhubertz@wustl.edu

Attorneys for the Sierra Club

Cc: Dana Skelley, Director, Air & Radiation Division, EPA Region 7
Michael Jay, Chief, Air Planning & Development Branch, EPA Region 7
Darcy Bybee, Director, Air Pollution Control Program, DNR
Emily Wilbur, Chief, Air Quality Planning Section, DNR

Washington University in St. Louis
SCHOOL OF LAW

Interdisciplinary Environmental Clinic

August 6, 2020

Ms. Emily Wilbur
Chief, Air Quality Planning Section
Air Pollution Control Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102
Via email to: apcpsip@dnr.mo.gov

Re: Redesignation Request for the Labadie Unclassifiable Area

Dear Ms. Wilbur:

On behalf of the Sierra Club, we submit the following comments on the Missouri Department of Natural Resources' ("DNR") request to reclassify the area around the Ameren Labadie Energy Center from unclassifiable to attainment for the 2010 1-hour sulfur dioxide ("SO_2") National Ambient Air Quality Standard ("NAAQS").[1] The U.S. Environmental Protection Agency ("EPA") designated the area, which includes portions of Franklin County and St. Charles County, Missouri, as unclassifiable in July 2016 pursuant to a court-ordered schedule requiring it to complete certain designations for the 2010 SO_2 NAAQS by July 2, 2016.[2]

We believe DNR's request to reclassify the Labadie area to attainment is premature. There is no ambient SO_2 monitor southeast of the plant, where modeling performed by Ameren in 2016 using the limited on-site meteorological data available at the time indicated peak 1-hour SO_2 concentrations were expected to occur. Additional on-site meteorological data collected in the ensuing three years shows that winds near the Labadie stack height are predominantly from the northwest, validating Ameren's 2016 modeling and reinforcing the need for a monitor southeast of the plant. No decisions regarding the attainment status of the area should be made until this significant data gap is filled.

The Data Gap Southeast Of The Labadie Plant Must Be Filled Before The Labadie Area's Attainment Status Can Be Determined

[1] DNR, Redesignation Request for the Labadie Unclassifiable Area Under the 2010 Sulfur Dioxide Standard (July 30, 2020) ("Labadie Redesignation Request").

[2] Areas subject to the July 2, 2016 deadline included "(1) Areas that have newly monitored violations of the 2010 SO_2 NAAQS and (2) areas that contain any stationary sources that had not been announced as of March 2, 2015, for retirement and that, according to the EPA's Air Markets Database, emitted in 2012 either (i) more than 16,000 tons of SO_2, or (ii) more than 2,600 tons of SO_2 with an annual average emission rate of at least 0.45 pounds of SO_2 per one million British thermal units (lbs SO_2/mmBTU)." EPA, Air Quality Designations for the 2010 Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard—Round 2, 81 Fed. Reg. 45039 (July 12, 2016) at 45042.

As explained in Sierra Club's comments on DNR's revised 2016 Monitoring Network Plan,[3] the modeling evaluation Ameren performed in 2016 using the available on-site meteorological data from the Valley monitoring site ("2016 modeling evaluation") strongly supported 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 [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 2016 modeling evaluation was 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 the 2016 modeling evaluation are shown in Figures 1-4 below. 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] 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, were calculated using the methodology described in Appendix A of the Monitoring TAD. Note that the "suggested monitor" in these figures (denoted by a pink triangle labeled Southeast) is not a current monitoring site location, but rather the location where Sierra Club recommended a monitor be installed based on the results of the 2016 modeling evaluation. Only the "current/planned monitors" in the figures (denoted by black triangles labeled North, Northwest, Southwest, and Valley) represent current monitoring site locations.

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[3] DNR, 2016 Monitoring Network Plan, Revision 1 (Nov. 15, 2016) ("Revised Plan").

[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").

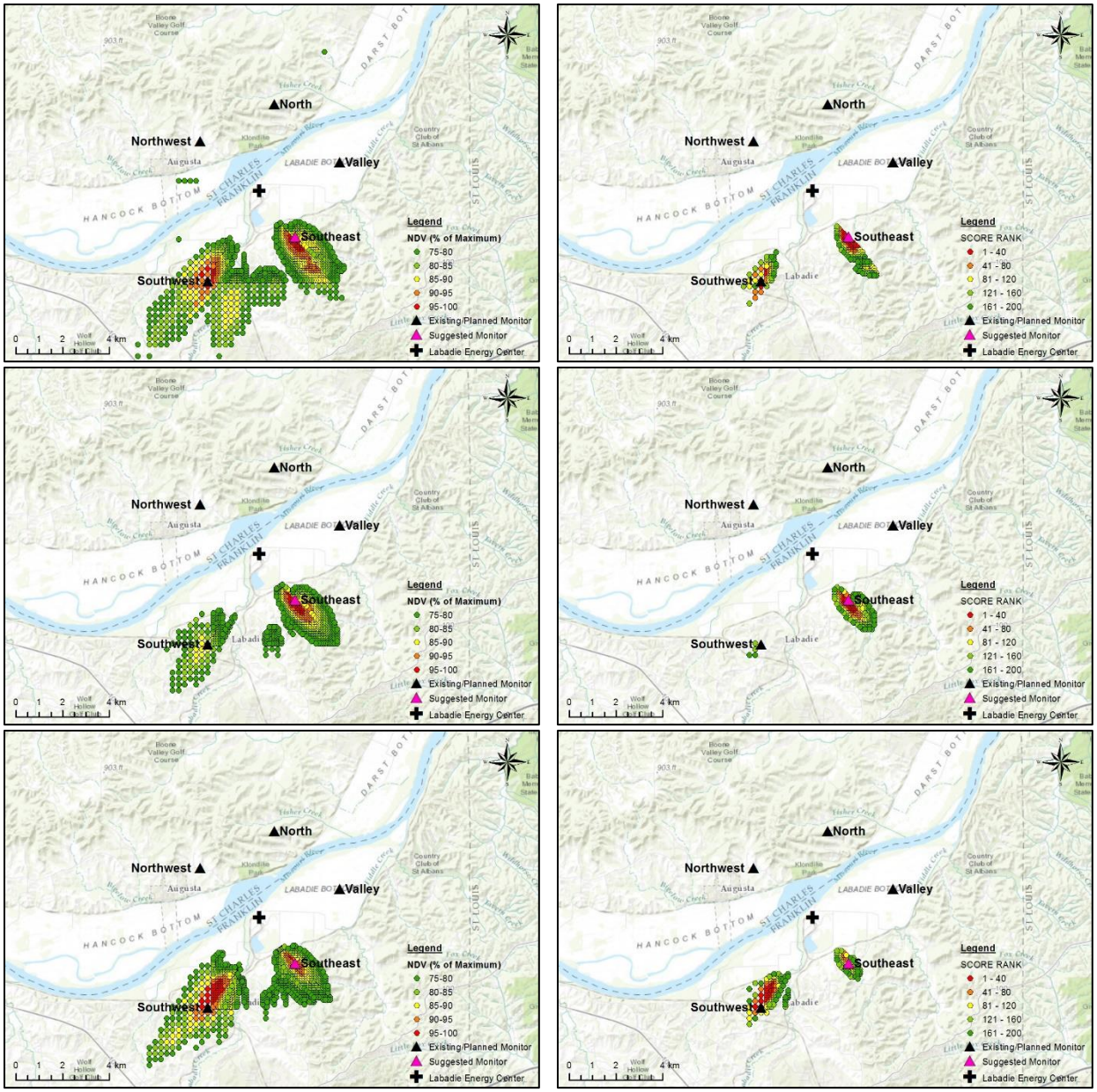

Figure 1: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using meteorological data from the Valley site. The top, middle, and bottom rows show results for the actual hourly emissions scenario, the high-load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

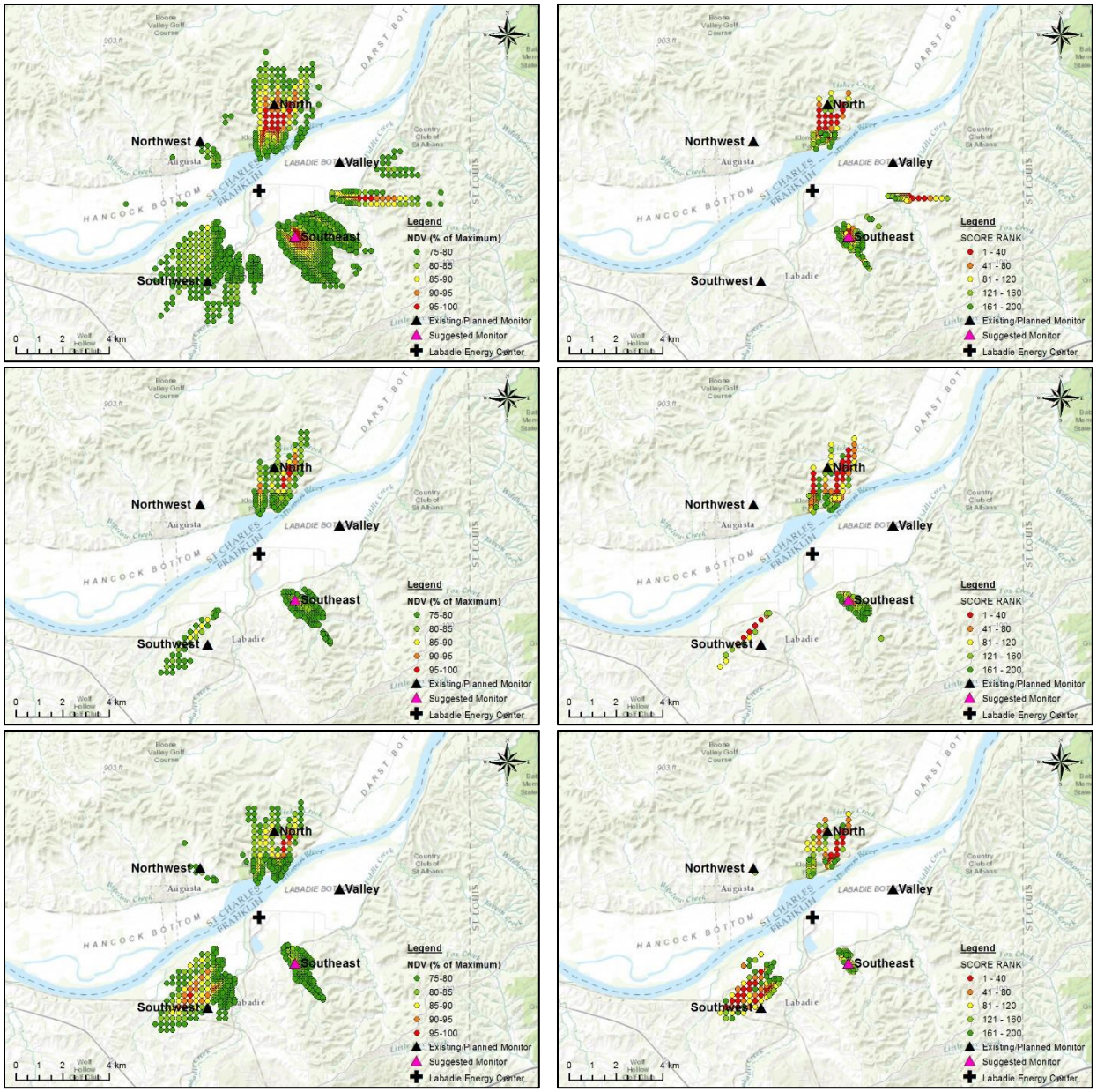

Figure 2: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using meteorological data from the Valley site with the gap in on-site data filled with NWS data from Jefferson City Memorial Airport. The top, middle,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

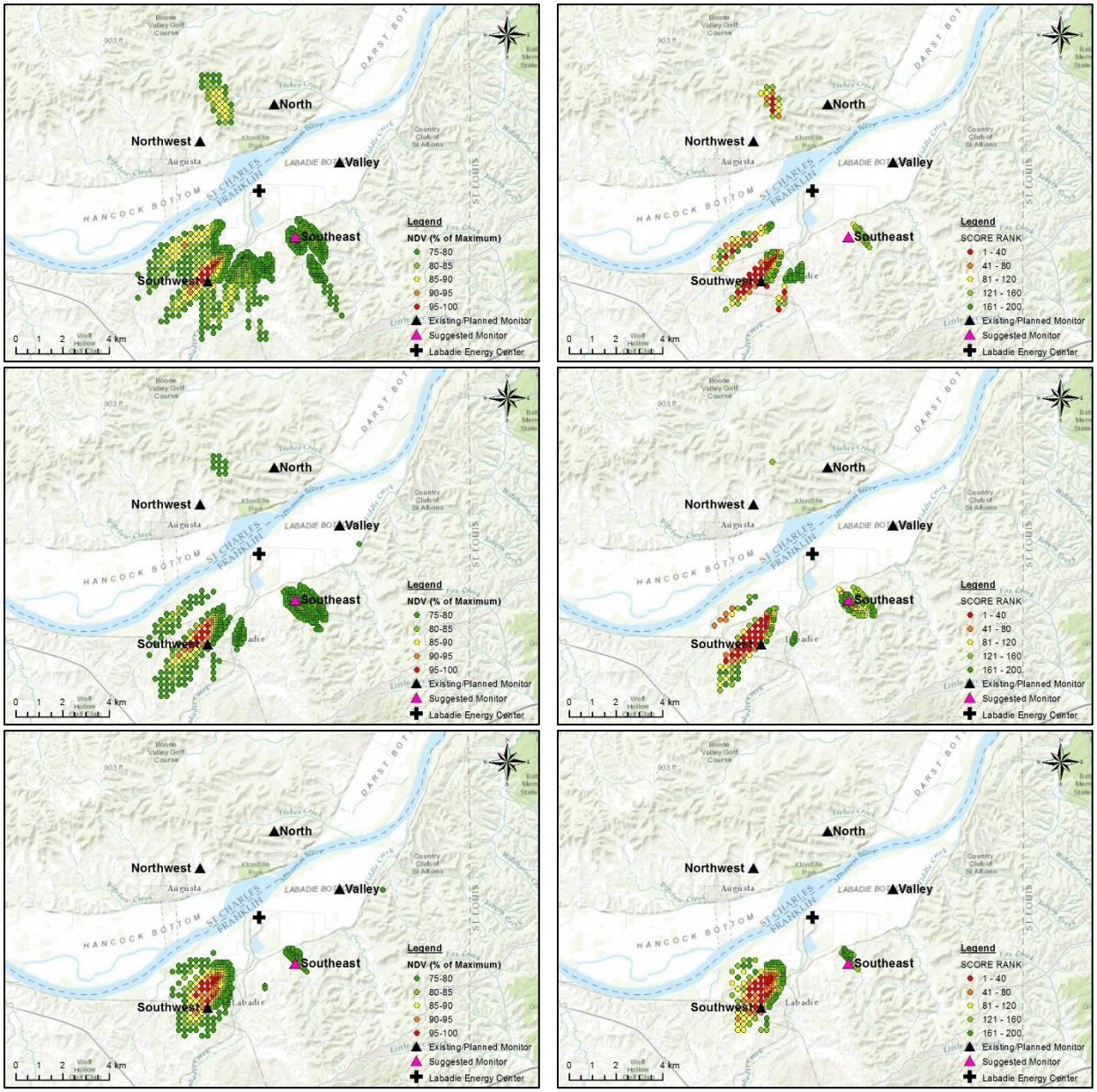

Figure 3: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using meteorological data from the Valley site with the gap in on-site data filled with NWS data from Spirit of St. Louis Airport. The top, middle,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

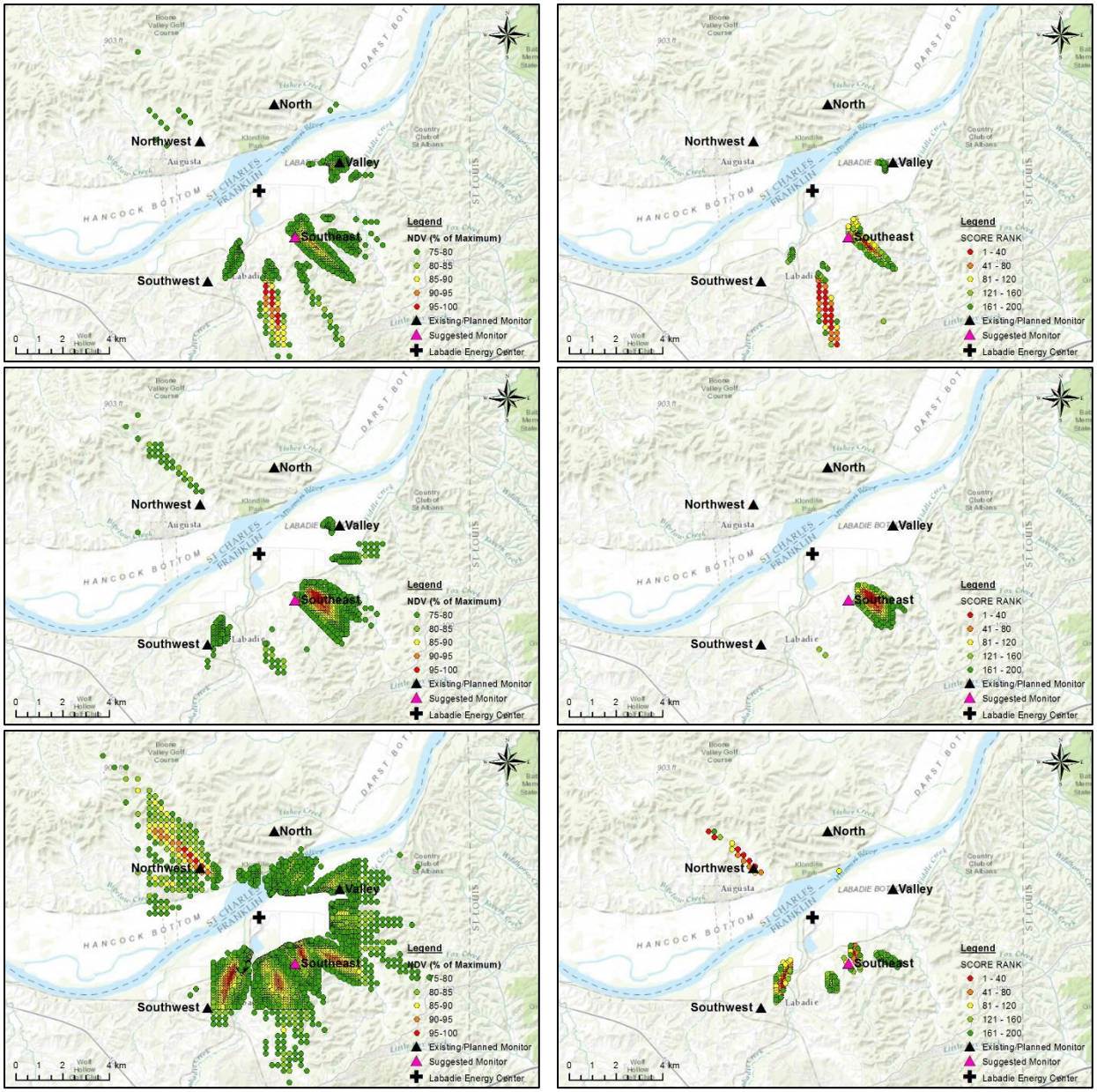

Figure 4: Normalized design values (left; all receptors exceeding 75% of the maximum NDV) and score ranks (right; top 200 receptors only) for modeling runs using Weather Research and Forecasting model meteorological data. The top, middle, and bottom rows show results for the actual hourly emissions scenario,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

As Figures 1-4 clearly show, all of Ameren's 2016 modeling predicted 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 varied somewhat depending on the meteorological and emissions datasets used. However, in every instance there was a grouping of top 200 receptors in the area that frequently included some of the most highly ranked receptors. Further, modeled

NDVs in the area were always greater than 75 percent of the maximum NDV and were greater than 90 or 95 percent of the maximum in over half of the model runs. Hence the modeling strongly supported a monitor southeast of the plant.

Ameren's own analysis of its 2016 modeling reached the same conclusion. Appendix 5 of DNR's revised 2016 Monitoring Network Plan included an analysis by Ameren that purported 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 this analysis are shown in Figures 5 and 6 below.[7]

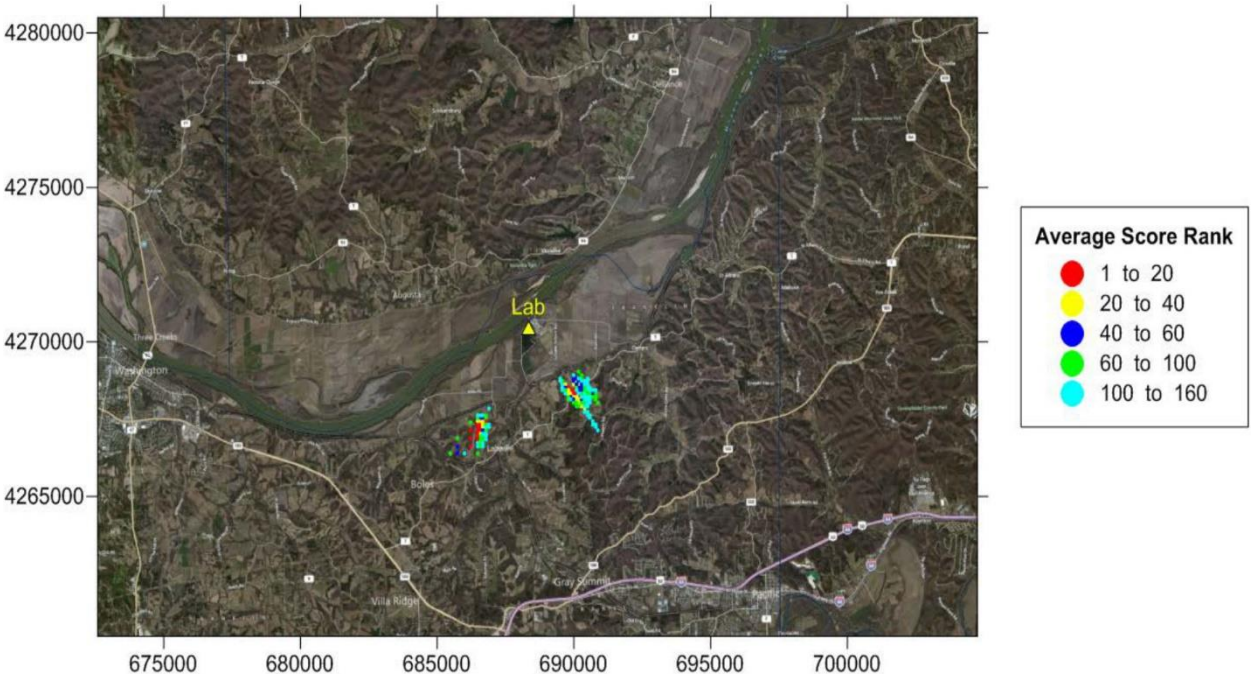

Figure 5. Summary average score rank over all met scenarios, actual hourly emissions scenario.

[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, Appendix 5.

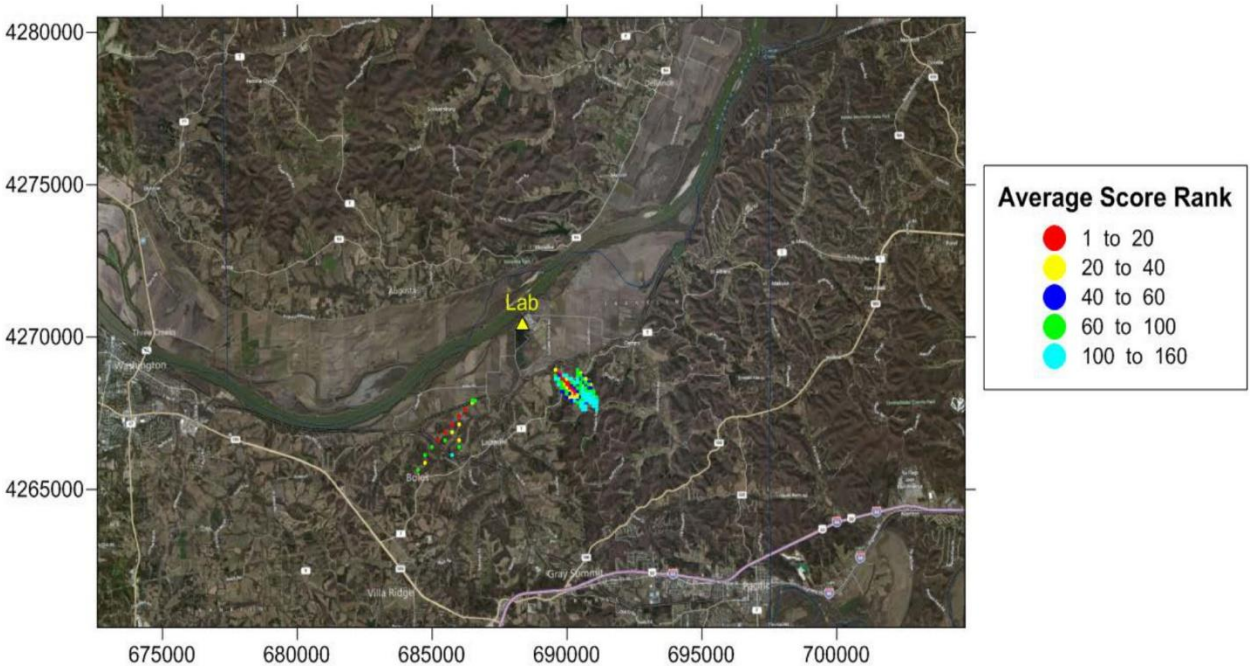

Figure 6. Summary average score rank over all met scenarios, high-load emissions scenario.

Figures 5 and 6 both show groupings of duplicate receptors with high average score ranks southeast and southwest of Labadie. Ameren provided this analysis to justify the new Southwest monitor it was proposing at the time. However, it also clearly demonstrated the need for a monitor southeast of the plant, an area Ameren itself labeled a "preferred monitoring location" like the area to the southwest.[8] In fact, it arguably showed a greater need for a monitor to the southeast than to the southwest due the preponderance of highly ranked receptors in that area. This led Sierra Club to conclude at the time, "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."[9]

Unfortunately, EPA approved DNR's revised 2016 Monitoring Network Plan without requiring Ameren to install a monitor southeast of Labadie. Now, more than three years later, on-site meteorological data collected in the ensuing years shows that this was a mistake and reaffirms the need for a monitor at this location to determine compliance with the 2010 SO_2 NAAQS. Since late February 2017, Ameren has operated a meteorological monitoring station at the Northwest monitor.[10] The wind rose for this monitor for the period February 23, 2017 through December 31, 2019 is shown in Figure 7 below.

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[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] Sierra Club comments on Revised Plan (Dec.14, 2016).
[10] Ameren has also continued to operate the meteorological monitoring station at the Valley monitor. However, the Valley monitor is located in the Missouri River Valley, where channeling is an issue. The Northwest monitor, by contrast, is located in elevated terrain to the north of the Missouri River Valley, where topographic wind effects like

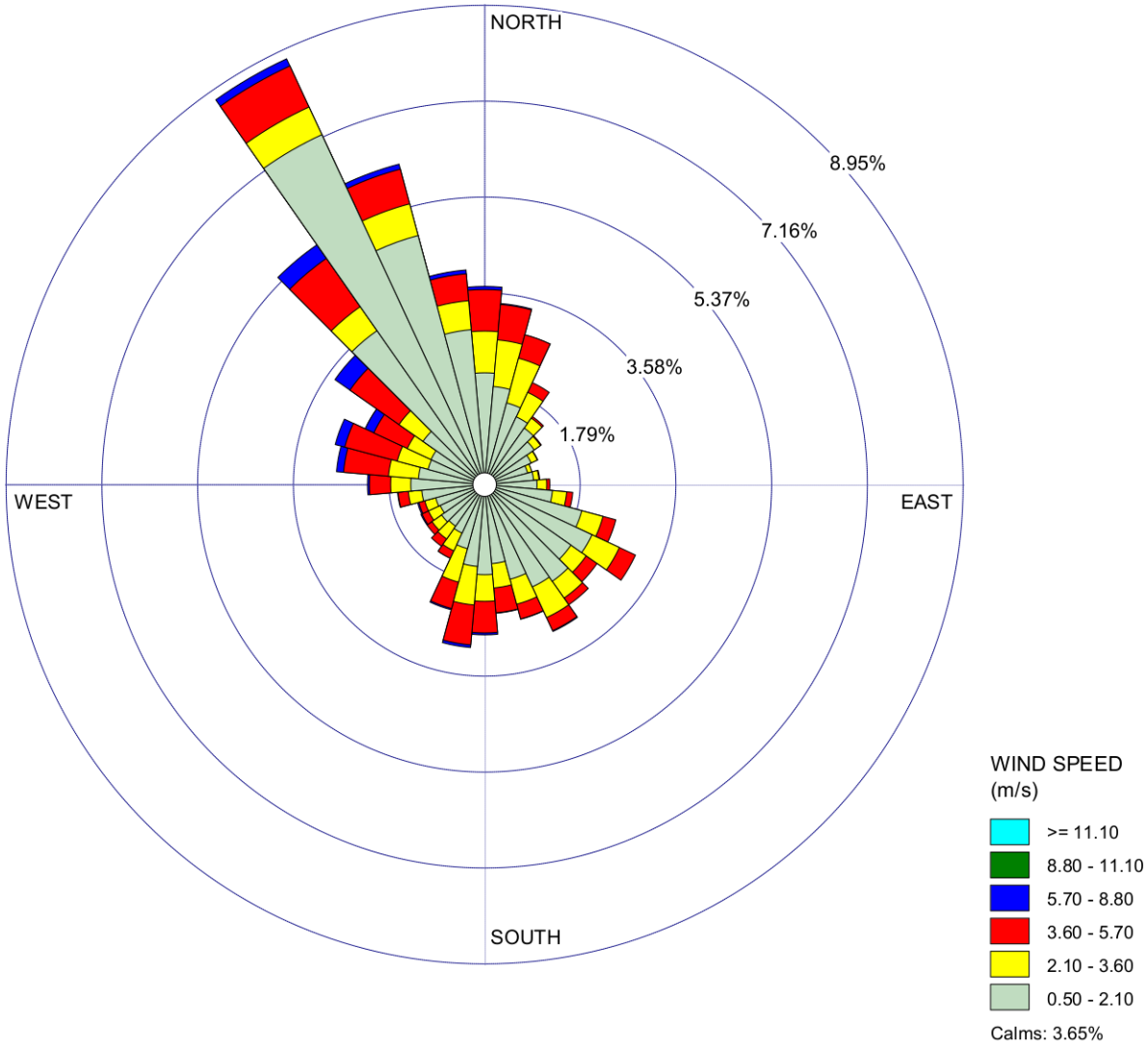

Figure 7. Northwest monitor wind rose, February 23, 2017 – December 31, 2019.

Figure 7 shows that the most frequent winds at the Northwest monitor during the 2017-2019 period were from the northwest. This was the case by a wide margin; winds were from the northwest roughly 20 percent of the time, or one out of every five days, which is several times the frequency of winds from any other direction. Given that wind direction approximates the direction of plume transport, this indicates that the Labadie plume was transported to the southeast much more frequently than in any other direction during the 2017-2019 period. Hence it is possible if not probable that the highest SO_2 concentrations during this period occurred southeast of Labadie, not to the north, northwest, southwest, or east, where the Labadie SO_2

channeling are less likely. It is also closer to Labadie's stack-tip elevation. As such, winds at the Northwest monitor are more representative of winds at stack height and better approximate the direction of plume transport.

monitors are located. As a result, SO_2 concentrations near Labadie may have exceeded the NAAQS in 2017-2019 even though the monitors all showed compliance with the standard during that time.

Conclusion

Areas are designated as unclassifiable when there is insufficient information available to determine whether or not they are attaining the NAAQS. While the addition of two new SO_2 monitors north and southwest of Labadie in 2016 was a positive step toward obtaining sufficient information to determine whether the area is attaining the 2010 SO_2 NAAQS, DNR and EPA's failure to also require the installation of a monitor southeast of the plant, where Ameren's 2016 modeling evaluation indicated peak 1-hour SO_2 concentrations were expected to occur and where on-site meteorological data collected in the ensuing years shows the Labadie plume is most frequently transported, has resulted in a significant data gap that must be filled before the area's attainment status can be determined. The fact that all existing monitors purport to show compliance with the standard[11] does not demonstrate that the entire area is attaining the standard if, as the available information strongly suggests, DNR has no data for the area with the highest concentrations. DNR's assertion that the basis for the unclassifiable area designation no longer exists now that all the monitors have valid design values is therefore untrue.[12] To the contrary, because DNR – due to the data gap southeast of the plant – lacks sufficient information to determine whether the entire area is attaining the NAAQS, unclassifiable remains the only justifiable designation for the area.

DNR's 2020 Monitoring Network Plan is currently on public notice.[13] We recommend the department shelve its redesignation request and modify the 2020 Monitoring Network Plan to include a new SO_2 monitor southeast of Labadie in order to fill the data gap in that area. Only when the new southeast monitor has a valid design value based on three years of quality-assured monitoring data will DNR have sufficient information to determine whether the Labadie area is attaining the 2010 SO_2 NAAQS. Although EPA indicated in its January 2017 response to Sierra Club's petition for reconsideration of the Labadie unclassifiable designation that it anticipated completing a new evaluation and potentially redesignating the area by December 31, 2020, it is under no deadline to act by that date. Hence, there is no reason to rush to judgement and seek redesignation to attainment before the data gap southeast of the plant is filled. Alternatively, if DNR and EPA insist on moving forward despite this critical data gap, then the agencies could utilize modeling to complete the designation now that three full years of on-site meteorological data are available. Labadie is still the largest source of SO_2 in Missouri and the largest coal-fired power plant in the country without SO_2 controls. As such, it is critically important that DNR

[11] All four monitors do not, in fact, show compliance with the standard. There is no valid 2017-2019 design value for the Valley monitor because the 2019 data for the Valley monitor, which was offline due to flooding from May 13 to August 2, 2019, is incomplete. This is yet another reason why DNR should not move forward with its redesignation request at this time.
[12] Labadie Redesignation Request at 1.
[13] DNR, 2020 Monitoring Network Plan (July 15, 2020), available at https://dnr.mo.gov/env/apcp/docs/2020-07-14-2020-monitoring-network-plan-with-appendix.pdf.

protect the public and not seek to redesignate the Labadie area until it has sufficient information to determine whether the area is, in fact, attaining the NAAQS.

Sincerely yours,

Elizabeth Hubertz, Director
Kenneth Miller, P.G., Environmental Scientist
Interdisciplinary Environmental Clinic
Washington University School of Law
One Brookings Drive – CB 1120
St. Louis, MO 63130
314-935-8760
ejhubertz@wustl.edu

Attorneys for the Sierra Club

Cc: Dana Skelley, Director, Air & Radiation Division, EPA Region 7
Michael Jay, Chief, Air Planning & Development Branch, EPA Region 7
Darcy Bybee, Director, Air Pollution Control Program, DNR

The comment letter and exhibit reproduced on the preceding pages state that an additional SO_2 monitoring site southeast of the Labadie Energy Center should be established, and that designation recommendations for the area around the Labadie facility should be delayed until three years of data be recorded at that proposed site.

The first two monitoring sites near the Labadie Energy Center, the Valley and Northwest sites, were sited based on the best available information at the time in 2015. These sites were later found to be insufficient when the SO_2 Data Requirements Rule (DRR) was published and new onsite meteorological data became available. In order to bolster the monitoring network Ameren commissioned an independent analysis to identify the areas of maximum concentration. This analysis had the benefit of onsite meteorology data from the meteorological station installed with the first monitors. The analysis recommended retaining the two existing sites and proposed two additional sites, the North and Southwest sites, which were installed and became operational by January 1, 2017. A Southeast site was proposed in the analysis as an alternate if one of the other two sites was infeasible; this Southeast site was not ultimately chosen, as it would capture similar concentrations as the existing Valley and Northwest sites. The current network of four sites in the Labadie area was proposed in the 2016 Monitoring Network Plan, which was approved by EPA.

As reported in the Department's request for redesignation of the Labadie area to attainment for the 2010 SO_2 NAAQS, the SO_2 design values at these four sites are all well below the level of the standard. Therefore, a southeast site, which would be at an elevation and distance from the facility similar to the North and Northwest sites, would have also shown design values below the level of the standard resulting from times when wind was from the northwest.

The Sierra Club petitioned EPA in 2016 to reconsider the unclassifiable designation of the Labadie area. In response, EPA committed to reconsider the designation once three years of quality-assured data had been collected. EPA is moving forward with this commitment, and a letter stating their intent to move forward with redesignation was sent to the Governor dated August 6, 2020. This started a 120-day timetable for EPA's decision. The Department is moving forward with a redesignation request in parallel with EPA's efforts to redesignate the area.

No additional SO_2 monitors are required to determine compliance with the NAAQS since EPA has already approved the monitors that will be used to meet the monitoring characterization requirements of the DRR, 40 CFR 51.1203(c) and the ambient air monitoring network meets the minimum monitoring requirements of 40 CFR 58.

In summary, data from a southeast site would capture similar concentrations to those from existing monitors, and therefore would not change the designation recommendation. Therefore, no changes were made to the plan because of this comment.

The following minor corrections (unrelated to the comment) were made to this final version of the plan:

- The section entitled “How to Make Public Comments Concerning this Plan” has been revised to indicate that the plan was posted for public review for 30 days, and that comments received are presented and addressed in this final version of the plan,

- The legend for the state’s monitoring network (page 8) was corrected to include the SO_2 monitor at the Mott Street site in Herculaneum,

- In Appendix 1, the height of the meteorological tower at the Buick Northeast site was corrected from 6 meters to 10 meters, and the latitude and longitude coordinates of a few sites were changed slightly to be more accurate.