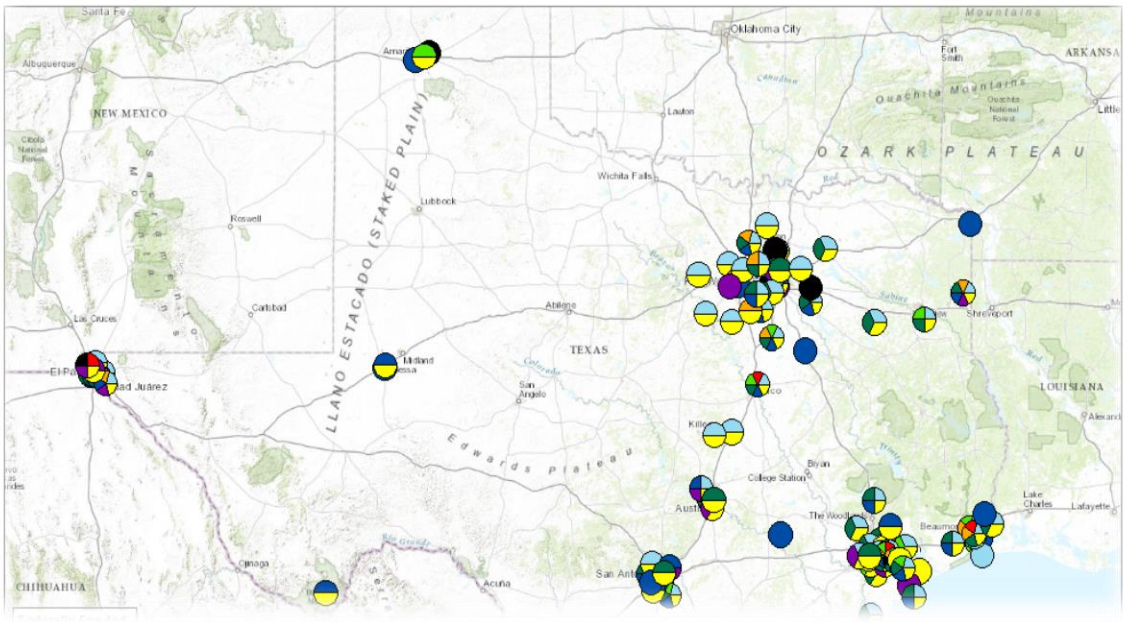
Texas Commission on Environmental Quality

Annual Monitoring Network Plan



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TCEQ

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INTRODUCTION

Title 40 Code of Federal Regulations (CFR) Part 58.10 requires states to submit an annual monitoring network plan (AMNP) to the United States (U.S.) Environmental Protection Agency (EPA) by July 1 of each year. This monitoring plan is required to provide the implementation and maintenance framework for an air quality surveillance system, known commonly as the ambient air quality monitoring network. The AMNP must be made available for public inspection and comment for at least 30 days prior to submission to the EPA. The AMNP is forwarded to the EPA for final review and approval along with any comments received during the 30-day inspection period and the associated Texas Commission on Environmental Quality (TCEQ) responses as an appendix.

This document provides information on the TCEQ ambient air monitoring network established to meet the National Ambient Air Quality Standards (NAAQS) regulatory requirements and other monitors that support this effort. This document presents the current Texas network, as well as recommended changes to the network, from July 1, 2016, through December 31, 2018. As described in 40 CFR Part 58, Appendix D, monitors are deployed to meet minimum design requirements for the State or Local Air Monitoring Stations (SLAMS), Photochemical Assessment Monitoring Stations (PAMS), and National Core Multipollutant Monitoring Stations (NCore) federally required ambient air monitoring networks. A list of all monitors and their respective networks is located in Appendix A.

Based on annual internal audits performed to date, all monitoring sites are meeting the requirements defined in 40 CFR Part 58 Appendices A, B, C, D, and E. As acknowledged by the EPA in the response letter to the TCEQ *2016 Annual Monitoring Network Plan*, received October 27, 2016, the Brownsville site (EPA air quality system [AQS] database number [#] 480610006) was not meeting the siting criteria defined in 40 CFR Part 58, Appendix E due to a utility structure constructed in the monitoring path of the sampler inlets after the site was deployed. The property owner relocated the structure causing the siting criteria violation; the site is now in compliance with all siting criteria. The TCEQ continues to recommend the decommission of some monitors at the Brownsville site as proposed in this AMNP.

Appendix B contains a summary of core based statistical areas (CBSAs) or metropolitan statistical areas (MSAs), which reference 2016 U.S. Census Bureau population estimates, and a summary count of required monitors. The TCEQ relied on this summary in evaluating monitors as documented in this AMNP. The U.S. Census Bureau defines CBSA as a collective term for MSAs, and the terms are used interchangeably in this plan.

REGULATORY NETWORK CHANGES

Nitrogen Dioxide

The TCEQ nitrogen dioxide (NO_2) network includes nitric oxide (NO), NO_2, and total reactive nitrogen compounds (NO_y) monitoring requirements. The TCEQ NO_2 network is designed to meet area-wide, Regional Administrator 40 (RA-40), and near-road monitoring requirements. Pursuant to the PAMS program, 40 CFR Part 58, Appendix D, Section 5 also requires hourly averaged NO, NO_2, and NO_y to be collected at NCore sites in CBSAs with a population of 1,000,000 or more persons. Title 40 CFR Part 58, Appendix D, Section 3 further requires NO and NO_y to be collected at all NCore sites, irrespective of population. The state-wide NO_2 network consists of NO_2 monitoring at 46 sites, with NO_y measured at five sites. Appendix C of this plan summarizes the monitoring requirements and the current number of NO_2 and NO_y monitors in each MSA in Texas.

Area-Wide Monitoring Requirements

Title 40 CFR Part 58, Appendix D, Section 4.3.3 requires one area-wide ambient air quality monitoring site in each CBSA with a population of 1,000,000 or more persons. The requirements stipulate that the site must be located in the area with the expected highest NO_2 concentration that is also representative of a neighborhood or larger (urban) spatial scale. Title 40 CFR Part 58, Appendix D, Section 4.3.5 (3) defines neighborhood scale monitoring as representative of air quality conditions in an area with dimensions between 0.5 and 4.0 kilometers, and urban scale monitoring as representative of air quality conditions in an area with dimensions between 4.0 and 50 kilometers.

Based on 2016 U.S. Census Bureau population estimates for Texas, area-wide neighborhood or urban scale NO_2 monitoring is required in the Austin-Round Rock, Dallas-Fort Worth-Arlington, Houston-Woodlands-Sugar Land, and San Antonio-New Braunfels CBSAs. The following four NO_2 monitors meet these area-wide requirements:

- Austin-Round Rock: Austin Northwest (AQS# 484530014);
- Dallas-Fort Worth-Arlington: Dallas Hinton (AQS# 481130069);
- Houston-The Woodlands-Sugar Land: Clinton (AQS# 482011035); and
- San Antonio-New Braunfels: San Antonio Northwest (AQS# 480290032).

Regional Administrator Monitoring Requirements

Title 40 CFR Part 58, Appendix D, Section 4.3.4 states that the EPA Regional Administrators will collaborate with the states to designate a minimum of 40 NO_2 monitoring stations nationwide that are sited in locations to protect susceptible and vulnerable populations. The TCEQ collaborated with the EPA to identify appropriate monitoring sites to meet this requirement which includes the following four NO_2 monitors, listed by CBSA:

- Beaumont-Port Arthur: Nederland High School (AQS# 482451035);
- Dallas-Fort Worth-Arlington: Arlington Municipal Airport (AQS# 484393011);
- El Paso: Ascarate Park Southeast (SE) (AQS# 481410055); and
- Houston-The Woodlands-Sugar Land: Clinton (AQS# 482011035).

Near-Road NO_2 Monitoring Requirements

Title 40 CFR Part 58, Appendix D, Section 4.3.2 requires one microscale near-road NO_2 monitor in each CBSA with a population of 1,000,000 or more persons to be located near a major road with high annual average daily traffic counts. An additional near-road monitor is required in each CBSA with a population of 2,500,000 or more persons. On December 30, 2016, the EPA published the final rule (81 Federal Register 96382) to approve changes to ambient NO_2 monitoring requirements that removed the requirement for near-road NO_2 monitoring stations in areas with populations between 500,000 and 1,000,000 persons. The current TCEQ near-road monitoring network, summarized in Table 1, is meeting this requirement with six near-road sites as approved in the TCEQ *2014 Annual Monitoring Network Plan* response letter from EPA Region 6 received January 14, 2015.

Table 1: Near-Road Site List

AQS Number	Site Name	Core Based Statistical Area	U.S. Census Bureau 2016 Population Estimate	Parameters Monitored (described below)
481131067	Dallas LBJ Freeway	Dallas-Fort Worth-Arlington	7,233,323	NO_2, met
484391053	Fort Worth California Parkway North	Dallas-Fort Worth-Arlington	7,233,323	NO_2, CO, $PM_{2.5}$, met
482011066	Houston Southwest Freeway	Houston-The Woodlands-Sugar Land	6,772,470	NO_2, met
482011052	Houston North Loop	Houston-The Woodlands-Sugar Land	6,772,470	NO_2, CO, $PM_{2.5}$, met
480291069	San Antonio Interstate 35	San Antonio-New Braunfels	2,429,609	NO_2, CO, $PM_{2.5}$, met
484531068	Austin North Interstate 35	Austin-Round Rock	2,056,405	NO_2, CO, $PM_{2.5}$, met

AQS – Air Quality System
met – meteorological equipment with sensors to monitor wind speed, wind direction, and ambient temperature
NO2 – nitrogen dioxide
CO – carbon monoxide
PM2.5 – particulate matter of 2.5 micrometers or less
U.S. – United States

Changes to the Regulatory NO_2 Monitoring Network

The TCEQ recommends relocating the NO_2 monitor at the Waco Mazanec site (AQS# 483091037) to the Killeen Skylark Field site (AQS# 480271047). The 2015 one-hour design value for the NO_2 monitor at the Waco Mazanec site is 24 parts per billion (ppb), 24 percent (%) of the NAAQS, and the design values have been trending downward since 2010. In the response letter to the TCEQ's *2015 Five-Year Ambient Air Monitoring Network Assessment* (five-year plan) dated July 15, 2016, the EPA recommended decommissioning NO_2 monitoring at Waco Mazanec in the future due to low design values. Relocating the NO_2 monitor to the Killeen Skylark Field site would allow the

TCEQ to better predict and document ozone formation in the Killeen-Temple CBSA, since monitored ozone levels are higher in this area than in Waco. NO_2 monitoring is not required in either the Waco or Killeen-Temple CBSAs under Title 40 CFR Part 58, Appendix D.

Based on the property owner's request, the TCEQ is relocating the Lynchburg Ferry site (AQS# 482011015) and therefore temporarily shut down the NO_2 monitor on March 14, 2017. The new site location will contain the same monitoring equipment, including NO_2, once the site preparation and electrical connections are complete. The EPA approved the proposed new location, approximately 0.22 miles southeast, in a letter dated March 9, 2017.

The TCEQ NO_2 network, as discussed above and summarized in Appendix C, meets or exceeds monitoring requirements in all areas. No further changes to the network are recommended at this time.

Sulfur Dioxide

Monitoring Requirements

Title 40 CFR Part 58, Appendix D, Section 4.4.2, requires states to establish a sulfur dioxide (SO_2) monitoring network based on a calculated population weighted emissions index (PWEI). This index is calculated by multiplying the population of a CBSA with the emissions inventory (EI) data for counties within that CBSA. The calculated value is then divided by one million to obtain the PWEI value. The PWEI monitoring requirements are listed below:

- one monitor in CBSAs with a PWEI value equal to or greater than 5,000, but less than 100,000;
- two monitors in CBSAs with a PWEI value equal to or greater than 100,000, but less than 1,000,000; and
- three monitors in CBSAs with a PWEI value equal to or greater than 1,000,000.

The TCEQ used the 2016 U.S. Census Bureau population estimates and 2014 National Emissions Inventory (NEI) data with 2015 TCEQ point-source EI data to calculate the PWEI and determine the minimum monitoring requirements for each CBSA. As shown in Appendix D, the TCEQ is currently meeting the SO_2 monitoring requirements determined by the PWEI analysis.

Title 40 CFR Part 58, Appendix D, Section 3 requires states to monitor SO_2 at NCore sites. The TCEQ is meeting this requirement with high-sensitivity SO_2 monitors at the following three NCore sites:

- Dallas Hinton (AQS# 481130069);
- El Paso Chamizal (AQS# 481410044); and
- Houston Deer Park #2 (AQS# 482011039).

The TCEQ is required to operate a total of 21 SO_2 monitors, and is currently meeting and exceeding the monitoring requirements with 36 SO_2 monitors in the network, as shown in Appendix D of this document.

Data Requirements Rule

On June 2, 2010, the EPA established a primary (health based) one-hour SO_2 NAAQS at a level of 75 ppb. On August 10, 2015, EPA finalized the *Data Requirements Rule for*

the 1-Hour Sulfur Dioxide Primary NAAQS (DRR). This rule requires air agencies to provide data to characterize air quality around sources that emit 2,000 tons per year (tpy) or more of SO_2 and that are not located in an area previously designated nonattainment.

The DRR establishes criteria for identifying the emission sources and associated areas for SO_2 air quality characterization. Air agencies have the option to characterize air quality by modeling predicted impacts of emissions or by using strategically sited ambient air quality monitors to measure actual area concentrations. The DRR provides the deadlines for source-oriented monitoring and/or modeling to characterize ambient air quality impacts from the identified SO_2 sources.

On January 15, 2016, the TCEQ provided the EPA with a list of 25 SO_2 sources meeting the DRR emissions applicability threshold. Appendix D of this plan lists the DRR required sources along with 2015 EI data and whether air quality is characterized through monitoring or modeling at each source. The TCEQ met the DRR monitoring requirements by deploying 11 source-oriented SO_2 monitors near 13 required sources by the January 1, 2017, deadline. Details related to the site evaluation and selection process for these 11 monitors are outlined in the TCEQ's *2016 Annual Monitoring Network Plan*, approved by the EPA on October 27, 2016. The specific facilities, station names, and activation dates are listed in Table 2. The remaining 12 sources were either characterized with modeling, designated nonattainment, or exempted from the DRR.

Table 2 also lists the three additional monitoring stations in areas designated nonattainment by the EPA, effective January 12, 2017. However, a request for reconsideration of all three SO_2 nonattainment designations was submitted to the EPA in February 2017. At this time, the TCEQ intends to deploy monitoring stations near Big Brown Steam Electric Station, Monticello Steam Electric Station, and Martin Lake Electrical Station based on the evaluation of monitoring locations outlined in Appendix E of this document. The proposed monitoring stations will include federal reference method (FRM) or federal equivalent method (FEM) monitors designated as special purpose monitors for determining compliance or progress towards compliance with the one-hour SO_2 standard in these nonattainment areas.

Table 2: Source-Oriented Sulfur Dioxide Monitoring Stations

Facility Name	County Name	Air Monitoring Station Name	AQS Number	Activation Date
Big Spring Carbon Black	Howard	Big Spring Midway	482271072	12/03/2016
Calaveras Plant	Bexar	San Antonio Gardner Road	480291080	11/18/2016
Oxbow Calcining	Jefferson	Port Arthur 7th Street	482451071	09/30/2016
AEP Pirkey Power Plant	Harrison	Hallsville Red Oak Road	482031079	12/06/2016
Streetman Plant	Navarro	Richland Southeast 1220 Road	483491081	11/16/2016
Welsh Power Plant	Titus	Cookville FM 4855	484491078	12/07/2016
Sandow Steam Electric Station	Milam	Rockdale John D. Harper Road	483311075	11/19/2016

Facility Name	County Name	Air Monitoring Station Name	AQS Number	Activation Date
Sandow 5 Generating Plant	Milam	Rockdale John D. Harper Road	483311075	11/19/2016
Oak Grove Steam Electric Station	Robertson	Franklin Oak Grove	483951076	10/13/2016
Borger Carbon Black Plant (Sid Richardson	Hutchinson	Borger FM 1559	482331073	11/02/2016
Borger Carbon Black Plant (Orion)	Hutchinson	Borger FM 1559	482331073	11/02/2016
Harrington Station Power Plant	Potter	Amarillo Xcel El Rancho	483751077	12/16/2016
Echo Carbon Black Plant (Orion)	Orange	Orange 1st Street	483611083	10/03/2016
Big Brown Steam Electric Station	Freestone	Fairfield FM 2570 Ward Ranch*	481611084	*
Monticello Steam Electric Station	Titus	Mount Pleasant FM 127*	484491074	*
Martin Lake Electrical Station	Rusk	Tatum CR 2181d Martin Creek Lake*	484011082	*

*Air monitoring site names are tentative and activation dates pending.
AQS – Air Quality System
FM – farm-to-market

Changes to the Regulatory SO_2 Monitoring Network

The TCEQ performed a detailed evaluation of the current SO_2 monitoring network, analyzing PWEI and DRR requirements, historical design value trends, and percentage of the NAAQS. Through this evaluation, the TCEQ identified six SO_2 monitors which are no longer required in the network. The TCEQ is requesting approval to decommission these monitors by December 31, 2017. Appendix D contains area maps that display the locations of each of the recommended monitors in relation to other SO_2 monitors in the area. Design values for these SO_2 monitors are all significantly lower than the NAAQS with decreasing trends from 2010-2016. Table 3 lists the recommended monitors with the percentage of the NAAQS and the design values from 2010-2016.

Table 3: Sulfur Dioxide Monitors Recommended for Decommission

		One-Hour SO_2 Design Value						
Site Name (AQS Number)	**Percentage of NAAQS**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
El Paso UTEP (481410037)	9%	9	8	7	7	5	5	6
Houston Monroe (482010062)	10%	27	22	20	16	13	10	7
Houston North Wayside (482010046)	10%	23	13	10	10	8	8	7
Italy (481391044)	10%	9	7	6	7	8	8	7
Seabrook Friendship Park (482011050)	11%	16	15	14	12	10	8	8
Skyline Park (481410058)	3%	5	3	3	3	2	2	2

% – percent
AQS – Air Quality System
NAAQS – National Ambient Air Quality Standards
ppb – parts per billion
SO_2 – sulfur dioxide
UTEP – University of Texas at El Paso

Lead

Monitoring Requirements

The TCEQ lead (Pb) network is designed to meet 40 CFR Part 58, Appendix D, Section 4.5 monitoring requirements. This section requires state agencies to conduct ambient air Pb monitoring near Pb sources that are expected to show, or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS of 0.15 micrograms per cubic meter ($\mu g/m^3$) on a rolling three-month average. Title 40 CFR Part 58, Appendix D, Section 4.5(a) requires a minimum of one source-oriented ambient air Pb monitoring site to measure maximum concentrations near each non-airport facility that emits 0.50 tpy or more of Pb annually, based on either the most recent NEI data or annual EI data submitted to meet state reporting requirements.

To meet these requirements, the TCEQ supports total suspended particulate (TSP) Pb monitoring at five source-oriented sites and five population exposure sites. The TCEQ network meets or exceeds federal requirements with Pb monitoring at a total of ten sites. The 2015 maximum three-month rolling averages for all existing Pb monitors are well below the NAAQS, with the highest concentration at 0.08 $\mu g/m^3$; 53% of the NAAQS.

The requirement to measure airborne particulate Pb at NCore sites was eliminated in the EPA's final rule published in the Federal Register on March 28, 2016, *Revisions to the Ambient Monitoring Quality Assurance and Other Requirements; Final Rule.* The EPA removed this requirement due to the extremely low Pb concentrations measured

at NCore sites. In accordance with this change, the TCEQ decommissioned NCore TSP Pb at three NCore sites in 2016: Dallas Hinton (AQS# 481130069), Houston Deer Park #2 (AQS# 482011039), and Ascarate Park SE (AQS# 481410055) in El Paso.

Collocation Requirements

Title 40 CFR Part 58, Appendix A, Section 3.4.4 requires a primary quality assurance organization to select 15% of the Pb monitoring sites within its network, not counting NCore sites, for collocated sampling, with the first of these sites measuring the highest Pb concentrations in the network. Based on the current network of primary Pb monitors, the TCEQ is required to have two collocated Pb monitors. The TCEQ has three collocated Pb monitors: Frisco Eubanks (AQS# 480850009) in Collin County; Ojo De Agua (AQS# 481411021) in El Paso County; and Terrell Temtex (AQS# 482570020) in Kaufman County.

The 2015 average concentration at the Frisco Eubanks site has decreased and is no longer the highest Pb concentration in the state. According to 2015 and 2016 data, the Terrell Temtex (AQS# 482570020) site now has the highest three-month rolling average concentration (0.08 µg/m^3) in the network. The TCEQ decommissioned the collocated monitor at Frisco 7 (AQS# 480850007) and deployed a new collocation monitor at Terrell Temtex in early 2017 to maintain compliance, as approved in the EPA response letter to the TCEQ *2016 Annual Monitoring Network Plan*, received October 27, 2016. The collocation monitor at Terrell Temtex was activated on April 13, 2017 to sample every 12th day.

Pb Waivers

Pursuant to 40 CFR Part 58, Appendix D, Section 4.5(a)(ii), the EPA Regional Administrator may waive the requirement in 40 CFR Part 58, Appendix D, 4.5(a) for monitoring near specific Pb sources with sufficient demonstration that the Pb source will not contribute to a maximum concentration in ambient air greater than 50% of the NAAQS of 0.15 µg/m^3, based on historical monitoring data, modeling, or other approved means. All approved waivers must be renewed once every five years as part of the network assessment required under 40 CFR Part 58.10(d).

The TCEQ submitted five Pb waivers for source-oriented monitoring since 2010, and the EPA Region 6 granted all five requests. Three of these waivers are no longer required because source emissions have decreased below the 0.50 tpy threshold. The remaining two Pb waivers remain effective. Requests to renew the Pb waivers for the Lower Colorado River Authority Fayette Power Plant in Fayette County and the U.S. Department of the Army facility in Fort Hood were submitted in the 2015 TCEQ *Texas Five-Year Ambient Monitoring Network Assessment.* The two waiver renewal requests included information regarding a Pb modeling analysis indicating that the predicted maximum ground level concentration for a rolling three-month average continued to remain below 50% of the NAAQS. The EPA Region 6 approved these waiver renewal requests in the TCEQ *2015 Annual Monitoring Network Plan* response letter, dated October 26, 2015. These renewals are valid until July 1, 2020. In addition to the waivers, a Pb ambient air monitor was deployed in 2011 to monitor ambient Pb concentrations downwind of the Conecsus, Limited Liability Company (LLC) facility just west of Terrell, Texas, therefore, no waiver request has been submitted for this source.

The TCEQ evaluated the 2013, 2014, and 2015 point source EI data for the Fayette Power Plant, Fort Hood, and Conecsus for comparison to the 0.50 tpy threshold, shown in Table 4. All three sources reduced their reported Pb emissions in 2014, and have continued to maintain emissions below the threshold in 2015. No additional sources reported emissions greater than 0.50 tpy in 2015.

Table 4: 2013-2015 Lead Point Source Emissions Inventory Data

Company	County	2013 Pb Emissions (tpy)	2014 Pb Emissions (tpy)	2015 Pb Emissions (tpy)	TCEQ Comments
United States Department of the Army, Fort Hood	Bell	0.74	0.08	0.16	Pb waiver renewal approved on October 26, 2015.
Lower Colorado River Authority	Fayette	0.59	0.51	0.49	Pb waiver renewal approved on October 26, 2015.
Conecsus LLC	Kaufman	0.69	0.33	0.34	Pb is currently monitored at the Terrell Temtex site.

LLC – limited liability company
Pb – lead
TCEQ – Texas Commission on Environmental Quality
tpy – tons per year

Collin County Pb Redesignation Request

On December 31, 2010, the EPA designated an area surrounding Exide Technologies, located in Frisco, Collin County, as nonattainment for the 2008 Pb NAAQS (75 Federal Register 71033). To demonstrate attainment, the area is required to have three-month rolling average monitoring data below the NAAQS for 36 consecutive months. The Collin County Pb monitoring network consists of four regulatory Pb ambient air quality monitors, one collocated Pb ambient air quality monitor, and a meteorological station. Data from these monitors are used to determine the area's compliance with the 2008 Pb NAAQS. Between January 1, 2013, and December 31, 2016, there was no measured three-month rolling average above the Pb NAAQS. The 2015 design value is 0.08 µg/m^3, while the preliminary 2016 design value for the area is 0.02 µg/m^3. Thus, the area has demonstrated compliance with the 2008 Pb NAAQS.

Based on measured compliance with the standard, the TCEQ adopted the *Collin County Redesignation Request and Maintenance Plan State Implementation Plan Revision for the 2008 Lead National Ambient Air Quality Standard* on October 19, 2016. In this state implementation plan (SIP) revision, the TCEQ requested that the Collin County Pb nonattainment area be redesignated as attainment for the 2008 Pb standard with the associated maintenance plan. The request was submitted to the EPA for approval on November 2, 2016. If the EPA approves the TCEQ request to designate the Collin County area as attainment for Pb, the TCEQ will evaluate and may propose changes to the existing Pb monitors in Collin County as allowed by the maintenance plan.

Changes to the Regulatory Pb Monitoring Network

Due to revisions to 40 CFR Part 58, Appendix D, Section 3(b) published by the EPA on March 28, 2016, TSP Pb monitoring is no longer a required measurement at NCore sites. In the 2016 AMNP, the TCEQ recommended to discontinue the TSP Pb monitors

at the three NCore sites: Dallas Hinton (AQS# 481130069), Ascarate Park SE (AQS# 481410055), and Houston Deer Park #2 (AQS# 482011039). The EPA approved the request in their response letter to the TCEQ *2016 Annual Monitoring Network Plan*, dated October 27, 2016. The TCEQ decommissioned the Pb monitors at these three NCore sites on December 31, 2016.

The TCEQ recommends to decommission the Brownsville site (AQS# 480610006) TSP Pb monitor. This monitor exceeds minimum monitoring requirements and is not required for source-oriented monitoring. The 2015 rolling three-month average design value for the Pb monitor at the site is 0.00 µg/m^3. The Pb levels at this site have been below the detection limit since 2000 (trended around 0.02 µg/m^3), and still remain below the limit.

The TCEQ recommends to decommission the Laredo Vidaurri site (AQS# 484790016) TSP Pb monitor by December 31, 2017. This monitor exceeds minimum monitoring requirements and is not required for source-oriented monitoring. The 2015 rolling three-month average design value for the Pb monitor at the site is 0.01, 6% of the NAAQS. The Pb levels at this site trended around 0.04 µg/m^3 in 2000, and have been trending downward since then.

Through existing ambient air monitors and current Pb waivers, the TCEQ is meeting or exceeding all federal Pb monitoring requirements.

Ozone

Monitoring Requirements

Network design criteria for SLAMS sites, described in 40 CFR Part 58, Appendix D, Section 4.1, require ozone (O_3) monitoring in each CBSA with a population of 350,000 or more persons. Monitoring is also required in CBSAs with lower populations if measured O_3 values in that MSA are within 85% of the NAAQS of 0.070 parts per million (ppm). According to 2016 U.S. Census Bureau population estimates and 2014-2016 eight-hour O_3 design values, the TCEQ is required to operate a minimum of 24 O_3 monitors to meet SLAMS network requirements. The TCEQ is exceeding the requirement with 46 O_3 monitors in the SLAMS network, as listed in Appendix A.

Additional O_3 monitoring is required under the NCore and PAMS monitoring networks, as described in 40 CFR Part 58, Appendix D, Sections 3 and 5, respectively. O_3 monitoring is required at all NCore sites to meet NCore network design criteria, and at NCore sites in CBSAs with a population of 1,000,000 or more persons to meet PAMS network requirements. The TCEQ is meeting NCore and PAMS network requirements with O_3 monitors at all three NCore sites in the Houston, Dallas, and El Paso CBSAs. As shown in Appendix F, the TCEQ is required to operate a total of 29 O_3 monitors to meet SLAMS, PAMS, and NCore design criteria, and is currently exceeding this requirement with 70 O_3 monitors in the network.

Changes to the Regulatory O_3 Monitoring Network

Based on the property owner's request, the TCEQ is relocating the Lynchburg Ferry site (AQS# 482011015) and therefore temporarily shut down the O_3 monitor on March 14, 2017. The new site location will contain the same monitoring equipment, including O_3, once the site preparation and electrical connections are complete. The EPA approved the proposed new location approximately 0.22 miles southeast, in a letter dated March 9, 2017.

The TCEQ recommends to decommission the O_3 monitor at the Brownsville site (AQS# 480610006), in accordance with the EPA comment to decommission this monitor in the response letter to the 2015 TCEQ *Texas Five-Year Ambient Monitoring Network Assessment,* dated July 15, 2016. This monitor is exceeding minimum requirements, with the O_3 monitor at the nearby Harlingen Teege site (AQS# 480611023) fulfilling design criteria for the SLAMS monitoring network. The O_3 design value at the Brownsville site is equal to that at the Harlingen Teege site: 0.057 ppm; 81% of the NAAQS.

As described above and summarized in Appendix F of this document, the TCEQ O_3 network is meeting or exceeding the current MSA requirements, and no additional changes to the network are recommended at this time.

Carbon Monoxide

Monitoring Requirements

Title 40 CFR Part 58, Appendix D, Section 3.0 requires carbon monoxide (CO) monitoring at NCore sites. EPA's Tec*hnical Assistance Document (TAD) for Precursor Gas Measurements in the NCore Multi-pollutant Monitoring Network – Version 4* (September 2005) recommends high-sensitivity CO monitors at the NCore sites. The TCEQ meets this requirement with high-sensitivity CO monitors at all three NCore sites in the Houston-The Woodlands-Sugar Land, Dallas-Fort Worth-Arlington, and El Paso CBSAs. Title 40 CFR Part 58, Appendix D, Section 4.2 also requires CO monitors collocated with required near-road NO_2 monitors in CBSAs of 1,000,000 or more persons. The TCEQ meets this requirement with CO monitors at near-road sites in the Austin-Round Rock, San Antonio-New Braunfels, Houston-The Woodlands-Sugar Land, and Dallas-Fort Worth-Arlington area CBSAs. The TCEQ deployed CO monitors at near-road sites in the Austin-Round Rock and San Antonio-New Braunfels CBSAs in December 2016 to meet the January 1, 2017, deadline.

The TCEQ CO monitoring network is required to operate a total of seven CO monitors. The TCEQ is currently exceeding the requirements with 15 total CO monitors: ten CO monitors and five high-sensitivity CO monitors. A summary of the required and current CO monitors in each CBSA is included in Appendix G.

The EPA revisions to the PAMS program under the final rule published on October 26, 2015, and as listed in 40 CFR Part 58, Appendix D, Section 5, remove CO from the list of required PAMS measurements. The CO monitors at the Houston Clinton site (AQS# 482011035) and the Beaumont Nederland High School site (AQS# 482451035) are now exceeding minimum requirements. The TCEQ will reevaluate the option to decommission these monitors during the assessment of the PAMS network to be published in the 2018 AMNP.

Changes to the Regulatory CO Monitoring Network

In compliance with near-road requirements in the Austin-Round Rock and San Antonio-New Braunfels CBSAs, the TCEQ deployed CO monitors at the Austin North Interstate 35 site (AQS# 484531068) and the San Antonio Interstate 35 site (AQS# 480291069) on December 19, 2016, and December 22, 2016, respectively.

The TCEQ recommends relocating the CO monitor at Ascarate Park SE (AQS# 481410055) in the El Paso CBSA to the University of Texas at El Paso (UTEP) site (AQS# 481410037). There are no CO monitoring requirements at either site, although the

TCEQ determined that a CO monitor would be useful at the UTEP site for evaluating potential ozone exceptional events related to wild fires. The 2016 eight-hour design value for the CO monitor at Ascarate Park is 2.4 ppm, 27% of the NAAQS. CO monitoring for the area would continue at the El Paso Chamizal site (AQS# 481410044) and the Ojo De Agua site (AQS# 481411021).

The TCEQ recommends decommissioning the CO monitor at the Brownsville site (AQS# 480610006). This monitor is exceeding minimum monitoring requirements for the Brownsville-Harlingen CBSA. The 2016 eight-hour design value for the CO monitor at the site is 0.9 ppm, 10% of the NAAQS. This recommendation supports the EPA comment that the TCEQ consider decommissioning this monitor in its response letter to the TCEQ *2016 Annual Monitoring Network Plan*, received October 27, 2016.

The TCEQ also recommends to decommission the CO monitor at the Laredo Bridge site (AQS# 484790017) in 2017. This CBSA is not required to have any CO monitors; the TCEQ currently operates two. The 2016 eight-hour design value for the CO monitor at the site is 1.2 ppm, 13% of the NAAQS. CO monitoring for the area would continue at the Laredo Vidaurri site (AQS# 484790016).

Tables 5 and 6 list the annual one-hour and eight-hour design values, respectively, from 2005 to 2015 for the CO monitors recommended for decommission.

Table 5: Carbon Monoxide One-Hour Design Values[1]

Site Name (AQS Number)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ascarate Park SE (481410055)	7.8	6.1	4.9	4.9	5.2	4.4	4.2	4.1	3.6	4.2	4.2
Brownsville (480610006)	3.4	2.1	2.1	1.6	1.7	1.4	1.7	1.2	1.5	1.1	1.9
Laredo Bridge (484790017)	5.0	5.7	3.9	3.7	2.7	N/A	N/A	N/A	2.2	1.9	2.8

[1]Annual one-hour CO design value in parts per million (ppm); one-hour CO NAAQS equals 35 ppm
AQS – Air Quality System
CO – carbon monoxide
NAAQS – National Ambient Air Quality Standard
SE – southeast
N/A – not applicable

Table 6: Carbon Monoxide Eight-Hour Design Values[1]

Site Name (AQS Number)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ascarate Park SE (481410055)	3.9	3.3	2.8	3.0	2.5	2.8	2.2	2.4	2.6	2.4	2.8
Brownsville (480610006)	1.7	1.1	1.1	0.8	0.8	0.8	0.9	0.5	0.8	0.7	1.0
Laredo Bridge (484790017)	3.0	4.3	2.2	2.3	1.6	N/A	N/A	N/A	1.2	1.2	1.2

[1]Annual eight-hour CO design value in parts per million (ppm); eight hour CO NAAQS equals 9 ppm
AQS – Air Quality System
CO – carbon monoxide
NAAQS – National Ambient Air Quality Standard
SE – southeast
N/A – not applicable

Particulate Matter of 10 Micrometers or Less

Monitoring Requirements

The TCEQ PM_{10} network is designed to meet the area requirements of 40 CFR Part 58, Appendix D, Section 4.6, specifying the range of PM_{10} monitoring stations required in MSAs based on population and measured concentrations, if available. A sample of this information is provided in Table 7. The TCEQ network consists of PM_{10} monitoring at 26 sites. Compliance with the PM_{10} standard is based on the number of measured exceedances of the 150 $\mu g/m^3$ standard on average over a three year period. The evaluation of PM_{10} monitoring requirements was completed using the 2016 U.S. Census Bureau population estimates and 2016 measured PM_{10} concentrations. This evaluation and the associated maximum 2014-2016 concentrations for each MSA are shown in Appendix H, Table 1. From this evaluation, the TCEQ determined that each MSA listed in Appendix H within the PM_{10} network meets or exceeds minimum PM_{10} monitoring requirements.

Table 7: Particulate Matter of 10 Micrometers or Less Monitoring Requirements

Population Category	High Concentration[1]	Medium Concentration[2]	Low Concentration[3]
>1,000,000	6-10	4-8	2-4
500,000-1,000,000	4-8	2-4	1-2
250,000-500,000	3-4	1-2	0-1
100,000-250,000	1-2	0-1	0

[1]High Concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding the PM_{10} NAAQS by 20 percent or more
[2]Medium Concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding 80 percent of the PM_{10} NAAQS
[3]Low Concentration areas are those for which ambient PM_{10} data show ambient concentrations less than 80 percent of the PM_{10} NAAQS
PM_{10} – particulate matter of 10 micrometers or less in diameter
> - greater than

Collocation Requirements

Title 40 CFR Part 58, Appendix A, Section 3.3.4 requires a primary quality assurance organization to select 15% of the manual PM_{10} monitoring sites within the PM_{10} network for collocated sampling. At least 50% of the selected sites should have an annual mean particulate matter concentration among the highest in the network. Appendix H, Table 2 lists the maximum concentration measurement during the 3-year period of 2014-2016 and also includes the 2014, 2015, and 2016 annual mean concentrations for each PM_{10} site. The TCEQ annually evaluates the data to determine network efficacy for the collocated PM_{10} monitors. Based on the current network of PM_{10} samplers, the TCEQ is required to operate four PM_{10} collocated samplers; the TCEQ is currently operating six. In 2017, the TCEQ plans to decommission the previously approved collocated monitor at the Texas City Fire Station site (AQS# 481670004). After this decommission, the TCEQ will continue to exceed collocation requirements with five collocated PM_{10} samplers in the network.

PM_{10} measured annual average concentration data was evaluated from 2014-2016, as shown in Appendix H, Table 2, to determine appropriate collocation sites within the network. PM_{10} measurement concentrations at Clinton (AQS# 482011035), Socorro Hueco (AQS# 481410057), and Convention Center (AQS# 481130050) sites had annual mean concentrations among the highest in the network and continue to satisfy collocation requirements. The three-year average PM_{10} concentration at Ojo De Agua (AQS# 481411021) is just within the highest 25% of the network, and these data also supports area exceptional events analysis. The PM_{10} collocated monitor at Houston Deer Park #2 (AQS# 482011039) supports collocation requirements for the NATTS program.

Changes to the Regulatory PM_{10} Monitoring Network

As approved by the EPA in their response letter to the TCEQ *2016 Annual Monitoring Network Plan*, dated October 27, 2016, the TCEQ decommissioned the collocated PM_{10} monitors, with primary monitors remaining active, at the Laredo Vidaurri (AQS# 484790016) and Dona Park (AQS# 483550034) sites, effective December 31, 2016. The TCEQ will decommission the collocated PM_{10} monitor at the Texas City Fire Station site (AQS# 481670004) in 2017.

The filters from the PM_{10} sampler at the Clinton site (AQS# 482011035) were analyzed for metals speciation in addition to gravimetric PM_{10} mass. The metals speciation analysis was originally proposed to meet an EPA national air toxics initiative that is no longer active. The speciation data are not required to meet any federal monitoring criteria, and are not requested by TCEQ stakeholders or the operating agency, the City of Houston. The special purpose metals speciation analysis was discontinued as of December 31, 2016. The TCEQ will maintain the PM_{10} gravimetric mass sampler at Clinton on a one in six day sampling schedule.

The source-oriented PM_{10} metals speciation sampler at the Morrell site (AQS# 481130018) in Dallas was deployed in 2010, to monitor elevated nickel and chromium levels upwind of Dal Chrome Co., Inc., an automotive chrome bumper recycling facility. Elevated annual nickel levels were detected at the site from 1987-2011. The annual average nickel concentrations decreased and stabilized in the range of 0.0023 to 0.3 $\mu g/m^3$ from 1998 through 2014. The annual average nickel concentration dropped significantly after Dal Chrome closed in November 2013. In May 2016, the property owner requested to remove the monitoring station immediately. With annual average

concentrations near 0.0 µg/m^3 and the source no longer active, the TCEQ decommissioned the special purpose monitor station effective June 1, 2016.

As summarized above and in Appendix H of this document, the TCEQ is meeting network monitoring requirements for PM_{10} and no additional changes are recommended at this time.

Particulate Matter of 2.5 Micrometers or Less

Monitoring Requirements

The TCEQ $PM_{2.5}$ network is designed to meet area, near-road, regional background, and regional transport requirements under the SLAMS network, as well as the NCore requirements for $PM_{2.5}$. In 2017, the TCEQ added $PM_{2.5}$ FEM continuous monitors to the network. Title 40 CFR Part 58, Appendix D, Section 4.7 requires $PM_{2.5}$ monitoring in MSAs with populations of 500,000 or more persons and in MSAs with lower populations if measured $PM_{2.5}$ design values for an MSA equals or exceeds 85% of the NAAQS. The $PM_{2.5}$ annual mean concentration NAAQS is 12.0 µg/m^3 averaged over three years and the $PM_{2.5}$ 24-hour average concentration standard is 35 µg/m^3 for the 98th percentile, averaged over three years.

Title 40 CFR Part 58, Appendix D, Section 4.7, Table D-5 lists the $PM_{2.5}$ MSA minimum SLAMS monitoring requirements. Title 40 CFR Part 58, Appendix D, Section 4.7.1(b)(2) requires a $PM_{2.5}$ monitor to be collocated at a near-road NO_2 station in CBSAs with a population of 1,000,000 or more persons. Additionally, 40 CFR Part 58, Appendix D, Section 3 requires $PM_{2.5}$ mass, $PM_{2.5}$ mass continuous, speciated $PM_{2.5}$, and coarse particulate matter ($PM_{10-2.5}$) mass monitoring at all NCore sites. Pursuant to 40 CFR Part 58, Appendix D, Section 4.7.2, the TCEQ must operate continuous $PM_{2.5}$ monitors equal to at least one-half the required number of SLAMS-required sites. At least one of these required continuous analyzers in each MSA must be collocated with one of the required FRM/FEM monitors, unless the FEM monitor is itself a continuous monitor. Finally, 40 CFR Part 58, Appendix D, Section 4.7.3 requires each state to install and operate at least one $PM_{2.5}$ site to monitor for regional background and at least one $PM_{2.5}$ site to monitor regional transport.

A detailed analysis of $PM_{2.5}$ monitoring and siting requirements using the 2016 U.S. Census Bureau population estimates and 2016 measured $PM_{2.5}$ concentrations is provided in Appendix I. The TCEQ's assessment of $PM_{2.5}$ monitoring requirements and current monitors is included in Appendix I, Table 1. Appendix I, Table 2 provides information regarding each $PM_{2.5}$ FRM/FEM site. A summary of the current $PM_{2.5}$ monitoring network based on requirements and design values is provided below in Table 8, sorted by MSA populations. Through this evaluation, the TCEQ determined that it meets or exceeds minimum monitoring requirements for all areas and parameters.

Table 8: Number of Required Particulate Matter of 2.5 Micrometers or Less Monitors

Metropolitan Statistical Area	FRM / FEM Required[1]	FRM / FEM Existing[2]	Speciation Required[1]	Speciation Existing[2]	Continuous Required[1,2]	Continuous Existing[2]
Dallas-Fort Worth-Arlington	4	7	1	2	2	6
Houston-The Woodlands-Sugar Land	5	7	1	2	5	9
San Antonio-New Braunfels	3	3	0	0	2	5
Austin-Round Rock	3	2	0	0	0	3
El Paso	2	2	1	1	2	4
McAllen-Edinburg-Mission4	2	2	0	0	1	1
Corpus Christi	1	2	0	1	1	1
Killeen-Temple	0	0	0	0	0	0
Brownsville-Harlingen	1	1	0	0	0	1
Beaumont-Port Arthur	0	0	0	0	0	3
Lubbock	0	0	0	0	0	1
Laredo	0	0	0	0	1	1
Waco	0	0	0	0	0	1
Amarillo	0	0	0	0	0	1
Odessa	0	0	0	0	0	1
Texarkana	0	1	0	0	1	1
Marshall3	0	1	0	1	1	1
Eagle Pass3	0	0	0	0	0	1
Corsicana3	0	0	0	0	0	1
Fayette County5	0	0	0	0	0	1
Big Bend National Park5	0	0	0	0	1	1
Totals	**21**	**28**	**3**	**7**	**17**	**44**

[1]Required monitors include State or Local Air Monitoring Stations (SLAMS), National Core (NCore), near-road, and regional background and transport sites.
[2]Individual monitors may fulfill one or more requirements.
[3]Area is classified as a micropolitan area, and is not subject to SLAMS requirements.
[4]Site annual values do not meet completeness criteria.
[5]Sites do not fall within a metropolitan or micropolitan statistical area.
FEM – federal equivalent method
FRM – federal reference method
$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter

Collocation Requirements

Title 40 CFR Part 58, Appendix A, Section 3.2.3 requires a primary quality assurance organization to select 15% of the $PM_{2.5}$ monitoring sites within the network for collocated sampling, for each distinct monitoring method designation (FRM or FEM). Fifty percent of the collocated audit monitors must be deployed at sites with annual average or daily concentrations estimated to be within plus or minus 20% of either the annual or 24-hour NAAQS.

Based on the current $PM_{2.5}$ network of 25 FRM monitors, the TCEQ is required to have four collocated $PM_{2.5}$ monitors. As of July 1, 2016, the TCEQ operated three collocated $PM_{2.5}$ monitors at Clinton (AQS# 482011035), Corpus Christi Huisache (AQS# 483550032), and Dallas Hinton (AQS# 481130069). To meet the minimum requirements, the TCEQ added a collocated $PM_{2.5}$ FRM monitor at the El Paso Chamizal site (AQS# 481410044), activated February 12, 2017. This site was chosen based on the annual and 24-hour $PM_{2.5}$ concentrations in the El Paso area. This site has an annual 2013-2015 design value of 9.9 $\mu g/m^3$, which is within 17% of the NAAQS, meeting the aforementioned collocation requirements.

The TCEQ will deploy $PM_{2.5}$ continuous FEM monitors (method code 209) in 2017 to replace aging $PM_{2.5}$ equipment. Table 10 (below) details the intended locations for these monitors. Pursuant to 40 CFR Part 58, Appendix A, Section 3.2.3.2(b), based on the intended $PM_{2.5}$ network of FEM monitors, the TCEQ will be required to have one primary $PM_{2.5}$ FRM monitor collocated with one $PM_{2.5}$ FEM monitor. To meet this requirement, the TCEQ deployed a collocated monitor at the Austin Webberville Rd site (AQS# 484530021) in March 2017.

Changes to the Regulatory $PM_{2.5}$ Monitoring Network

In compliance with near-road monitoring requirements, the TCEQ deployed a new $PM_{2.5}$ FRM monitor to the San Antonio Interstate 35 site (AQS# 480291069), activated January 1, 2017, and relocated the $PM_{2.5}$ FRM monitor from the Austin Audubon Society site (AQS# 484530020) to the Austin North Interstate 35 near-road site (AQS# 484531068), activated January 7, 2017.

As discussed in the TCEQ 2015 AMNP, the TCEQ relocated the Texarkana monitoring site (AQS# 480370004) approximately one mile northwest to physically accommodate both an FRM monitor and a continuous monitor to comply with requirements. The new monitoring site is Texarkana New Boston (AQS# 480371031). The EPA approved this site on March 23, 2016. This site fulfills area requirements for a continuous $PM_{2.5}$ monitor and a $PM_{2.5}$ FRM monitor. The design value for the Texarkana MSA for 2013-2015 was 9.8 $\mu g/m^3$, with a decreasing trend from the 2012-2014 design value of 10.2 $\mu g/m^3$. In the response letter to the TCEQ *2016 Annual Monitoring Network Plan*, dated October 27, 2016, the EPA approved the TCEQ's request to reduce the sampling frequency of the FRM monitor at this site from every third day to every sixth day. The TCEQ officially changed the sampling frequency for this monitor to every sixth day on December 8, 2016.

In the response letter to the 2016 AMNP, the EPA approved the TCEQ's recommendation to decommission the four $PM_{2.5}$ continuous tapered element oscillating microbalances (TEOM) monitors listed in Table 9. Table 9 lists the deactivation date for each monitor.

Table 9: Continuous Particulate Matter of 2.5 Micrometers or Less Deactivation Summary

AQS Number	Site Name	Metropolitan Statistical Area	Deactivation Date
481130069	Dallas Hinton	Dallas-Fort Worth-Arlington	December 31, 2015
482011042	Kingwood	Houston-The Woodlands-Sugar Land	December 31, 2016
481391044	Italy	Dallas-Fort Worth-Arlington	December 6, 2016
481350003	Odessa Hays Elementary School	Odessa	December 31, 2016

AQS – Air Quality System

On July 31, 2016, the TCEQ concluded a special study for the EPA on black carbon at the Houston Deer Park #2 monitoring site (AQS# 482011039). The study required the operation of two instruments: a Sunset carbon analyzer collocated with an aethelometer. On November 29, 2016, the TCEQ requested to decommission these two instruments by December 30, 2016, because they were not necessary to meet federal monitoring requirements. In a letter dated January 5, 2017, the EPA approved the TCEQ's request to decommission the Sunset carbon analyzer and the aethelometer. Both instruments were decommissioned, effective December 31, 2016.

In the TCEQ *2016 Annual Monitoring Network Plan* response letter, dated October 27, 2016, the EPA also requested an update regarding decommissioning the City Public Service Pecan Valley site (AQS# 480290055). Per the property owner's request, the $PM_{2.5}$ TEOM at this site was decommissioned on November 23, 2015.

In 2017, the TCEQ will introduce a new $PM_{2.5}$ continuous FEM monitor to the network, a beta attenuation mass (BAM-1022) monitor, method code 209. The new BAM-1022 will replace aging equipment in the $PM_{2.5}$ network to reduce data loss. In some cases, the monitor will replace a stand-alone $PM_{2.5}$ continuous TEOM with non-regulatory designations. In other cases, the new FEM monitor will replace a $PM_{2.5}$ FRM filter based monitor collocated with a $PM_{2.5}$ continuous TEOM. The changes to the $PM_{2.5}$ network are detailed by site, monitor type, and method code in Table 10, and will be completed by December 31, 2017.

Table 10: Particulate Matter of 2.5 Micrometers or Less Deployments and Method Code Changes Summary

AQS Number	Site Name	Monitor(s) to be Replaced	FEM Monitor to be Added	Current Method Code(s) Designation	New Method Code Designation
484530021	Austin Webberville Road	PM2.5 TEOM	BAM-1022	702 (non-regulatory)	209
482010058	Baytown	PM2.5 FRM	BAM-1022	145	209
482010058	Baytown	PM2.5 TEOM	BAM-1022	702 (non-regulatory)	209
480430101	Bravo Big Bend	PM2.5 TEOM	BAM-1022	702 (non-regulatory)	209

AQS Number	Site Name	Monitor(s) to be Replaced	FEM Monitor to be Added	Current Method Code(s) Designation	New Method Code Designation
482450022	Hamshire	$PM_{2.5}$ TEOM	BAM-1022	702 (non-regulatory)	209
480610006	Brownsville	$PM_{2.5}$ FRM	BAM-1022	702 (non-regulatory)	209
482011034	Houston East	$PM_{2.5}$ TEOM	BAM-1022	702 (non-regulatory)	209
482150043	Mission	$PM_{2.5}$ TEOM	BAM-1022	702 (non-regulatory)	209
482450021	Port Arthur Memorial	$PM_{2.5}$ TEOM	BAM-1022	702 (non-regulatory)	209
483611100	SETRPC 42 Mauriceville	$PM_{2.5}$ TEOM	BAM-1022	702 (non-regulatory)	209
484790313	World Trade Bridge	$PM_{2.5}$ TEOM	BAM-1022	702 (non-regulatory)	209

AQS – Air Quality System
BAM – beta attenuation mass (monitor)
FRM – federal reference method
FEM – federal equivalent method
$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter
TEOM – tapered element oscillating microbalances

The $PM_{2.5}$ TEOMs at the Brownsville site (AQS# 480610006), the Austin Webberville Rd site (AQS# 484530021), the Hamshire site (AQS# 482450022), and the Baytown site (AQS# 482010058) all experienced irreparable catastrophic instrument failures. The shutdown date for each of these instruments is the date of failure, with the exception of the Brownsville and Hamshire $PM_{2.5}$ TEOMs, which were deactivated effective December 31, 2016. The shutdown date for the Austin Webberville Rd $PM_{2.5}$ TEOM is September 19, 2016, and the shutdown date for the Baytown $PM_{2.5}$ TEOM is December 31, 2016. As shown in Table 10, a $PM_{2.5}$ continuous FEM monitor (BAM-1022) was deployed to the Austin Webberville Road, Baytown, and Hamshire sites to replace the existing equipment, with the effective dates for the newly-deployed instruments as April 27, 2017, March 21, 2017, and May 16, 2017, respectively. With the deployment of the $PM_{2.5}$ FEM BAM-1022 to Baytown, the TCEQ decommissioned the $PM_{2.5}$ FRM monitor at the site, effective March 20, 2017 (the BAM-1022 replacing both the $PM_{2.5}$ TEOM and the $PM_{2.5}$ FRM). The TCEQ will update the $PM_{2.5}$ FRM at Brownsville to a $PM_{2.5}$ continuous FEM monitor (BAM-1022) in 2017.

The TCEQ recommends to decommission the two $PM_{2.5}$ continuous special purpose monitors listed in Table 11. The remaining monitors in these MSAs continue to meet and exceed federal requirements.

Table 11: Particulate Matter of 2.5 Micrometers or Less Decommission Recommendation Summary

AQS Number	Site Name	MSA	Type of Monitor	2016 Annual Mean ($\mu g/m^3$)	MSA Required Monitors	MSA Existing Monitors	Rationale
484530020	Austin Audubon	Austin-Round Rock	$PM_{2.5}$ TEOM	7.2	1	3	Exceeds area requirements
480290053	Selma	San Antonio-New Braunfels	$PM_{2.5}$ TEOM	8.4	2	5	Exceeds area requirements; close proximity to $PM_{2.5}$ near-road monitor

$\mu g/m^3$ – micrograms per cubic meter
AQS – Air Quality System
MSA – metropolitan statistical area
$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter
TEOM – tapered element oscillating microbalances

Through existing ambient air monitors (primary and collocated), the TCEQ is meeting or exceeding all federal $PM_{2.5}$ monitoring requirements.

Volatile Organic Compounds

Monitoring Requirements

Title 40 CFR Part 58, Appendix D, Section 5 requires hourly averaged speciated volatile organic compound (VOC) monitoring at NCore sites located in CBSAs with a population of 1,000,000 or more persons as part of the PAMS network requirements. The TCEQ meets this requirement with a minimum of one automated gas chromatograph (autoGC) at each NCore site. The TCEQ also monitors speciated VOC concentrations using discrete canister sampling. The TCEQ has eight autoGCs and six canister samplers in the PAMS network and an additional four canister samplers to support the NATTS and special purpose monitoring.

Changes to the VOC Monitoring Network

All samplers in the VOC monitoring network are meeting federal requirements, and no changes are recommended at this time. The TCEQ will reevaluate all PAMS VOC measurements during the assessment of the PAMS network to be published in the 2018 AMNP.

The PAMS network canister samplers and autoGC monitors are listed in Table 12, and a complete list of these monitors is in Appendix A of this document.

Table 12: Canister and Automated Gas Chromatograph Site List

AQS Number	TCEQ Region	Site Name	Sampler Type	AQS Network & Monitor Type
481130069	04-Dallas/Fort Worth	Dallas Hinton	Canister	PAMS
481130069	04-Dallas/Fort Worth	Dallas Hinton	AutoGC	PAMS/NCore
481210034	04-Dallas/Fort Worth	Denton Airport South	Canister	PAMS
481391044	04-Dallas/Fort Worth	Italy	Canister	PAMS
482511008	04-Dallas/Fort Worth	Johnson County Luisa	Canister	SPM
484391002	04-Dallas/Fort Worth	Fort Worth Northwest	Canister	PAMS
484391002	04-Dallas/Fort Worth	Fort Worth Northwest	AutoGC	PAMS
484393009	04-Dallas/Fort Worth	Grapevine Fairway	Canister	PAMS
482030002	05-Tyler	Karnack	Canister	NATTS
481410044	06-El Paso	El Paso Chamizal	AutoGC	PAMS/NCore
482450009	10-Beaumont	Beaumont Downtown	AutoGC	PAMS
482451035	10-Beaumont	Nederland High School	AutoGC	PAMS
482010026	12-Houston	Channelview	AutoGC	PAMS
482011035	12-Houston	Clinton	AutoGC	PAMS
482011039	12-Houston	Houston Deer Park #2	Canister	NATTS/PAMS
482011039	12-Houston	Houston Deer Park #2	Canister	NATTS, QA Collocated
482011039	12-Houston	Houston Deer Park #2	AutoGC	PAMS/NCore
484790017	16-Laredo	Laredo Bridge	Canister	Border

– number
AQS – Air Quality System
AutoGC – automated gas chromatograph
NATTS – National Air Toxics Trends Stations
NCore – National Core Multipollutant Monitoring Stations
PAMS – Photochemical Assessment Monitoring Stations
QA – quality assurance
SPM – special purpose monitor
TCEQ – Texas Commission on Environmental Quality

Carbonyls

Monitoring Requirements

According to PAMS network requirements listed under 40 CFR Part 58, Appendix D, Section 5, the TCEQ is required to collect three eight-hour averaged carbonyl samples per day on a 1 in 3 day schedule at each NCore site located in a CBSA with a population of 1,000,000 or more persons. The TCEQ collects carbonyl samples at the Clinton (AQS# 482011035) and Dallas Hinton (AQS# 481130069) PAMS sites. In addition, the TCEQ has two special purpose carbonyl samplers in support of the NATTS program and two additional special purpose samplers each collecting one, 24-hour sample every six days. The TCEQ exceeds monitoring requirements with a total of six carbonyl samplers at the sites listed below:

- Dallas Hinton (AQS# 481130069);
- Clinton (AQS# 482011035);

- Houston Deer Park #2 (AQS# 482011039);
- Karnack (AQS# 482030002);
- Fort Worth Northwest (AQS# 484391002); and
- Ascarate Park SE (AQS# 481410055).

Changes to the Carbonyl Monitoring Network

The TCEQ proposes to change the sampling frequency in accordance with PAMS requirements listed under 40 CFR Part 58, Appendix D, Section 5, to collect three, eight hour carbonyl samples per day at the Clinton (AQS# 482011035) and at the Dallas Hinton (AQS# 481130069) sites. The TCEQ will further evaluate all PAMS carbonyl measurements during the assessment of the PAMS network to be published in the 2018 AMNP.

As summarized above and in Appendix A of this document, the TCEQ carbonyl monitoring network is meeting or exceeding all requirements, and no changes are recommended at this time.

Meteorology

Monitoring Requirements

Title 40 CFR Part 58, Appendix D, Section 5 requires surface and upper-air meteorology measurements at all PAMS sites located at NCore stations in CBSAs with a population of 1,000,000 or more persons. The TCEQ collects surface meteorology data at all PAMS sites and most network sites. Surface meteorology includes wind speed, wind direction, and outdoor temperature. The TCEQ operates radar profilers to fulfill the PAMS upper air meteorology requirements. Surface meteorology and upper air meteorology are included in the Appendix A site list.

Changes to the Meteorology Monitoring Network

The $PM_{2.5}$ TEOM at the Kingwood site (AQS# 482011042) was decommissioned effective December 31, 2016, as described above. The site included a precipitation monitor, which was decommissioned on January 20, 2017.

The TCEQ temporarily shut down the surface meteorology (solar radiation, wind speed, wind direction, and temperature) at the Lynchburg Ferry site (AQS# 482011015) on March 14, 2017, at the request of the property owner. The owner notified the TCEQ of the intent to redevelop the surrounding area. The EPA approved the proposed new location approximately 0.22 miles southeast, in a letter dated March 9, 2017. The new site location will contain the same monitoring equipment, including solar radiation, wind speed, wind direction, and temperature, once the site preparation and electrical connections are complete.

SUMMARY

Status of Network Changes During the Past Year

The following is a summary of changes that have occurred since the 2016 AMNP.

- Based on the clarification for NO_2 monitoring requirements published in the Federal Register on March 28, 2016, *Revisions to the Ambient Monitoring Quality Assurance and Other Requirements: Final Rule*, the NCore network designation from the NO_2 monitors was removed at El Paso Chamizal (AQS# 481410044) and Houston Deer Park #2 (AQS# 482011039) from AQS, effective April 27, 2016.
- The TCEQ deployed the 11 required SO_2 monitoring stations (method code 109) by January 1, 2017, to characterize the ambient air near SO_2 emissions sources in accordance with the DRR. Details and site activation dates are listed in Table 2 of this document.
- To maintain compliance with collocation requirements, the TCEQ decommissioned the collocated Pb monitor at Frisco 7 (AQS# 480850007) on January 31, 2017, and deployed a collocated Pb monitor (method code 192, sampling every twelfth day) to Terrell Temtex (AQS# 482570020), effective April 13, 2017.
- Pursuant to revisions to 40 CFR Part 58, Appendix D, Section 3(b) published by the EPA on March 28, 2016, the TCEQ decommissioned Pb monitors at the three NCore sites, Houston Deer Park #2 (AQS# 482011039), Dallas Hinton (AQS# 481130069), and Ascarate Park (AQS# 481410055) on December 31, 2016.
- In compliance with near-road requirements in the Austin-Round Rock and San Antonio-New Braunfels CBSAs, the TCEQ deployed gas filter correlation CO monitors (method code 93) at the Austin North Interstate 35 (AQS# 484531068) and San Antonio Interstate 35 (AQS# 480291069) sites, effective December 19, 2016 and December 22, 2016, respectively.
- PM_{10} metals speciation analysis from the PM_{10} sampler at the Clinton site (AQS# 482011035) was discontinued on December 31, 2016. The PM_{10} mass sampler at this site will continue to provide gravimetric data on a one-in-six days sampling frequency.
- The Pasadena HL&P (AQS# 482010071) PM_{10} monitor in the Houston-Woodlands-Sugar Land MSA was decommissioned on December 31, 2016.
- The collocated PM_{10} monitors at the Laredo Vidaurri (AQS# 484790016) and Dona Park (AQS# 483550034) sites were decommissioned, effective December 31, 2016. Primary monitors at both sites will remain active. The TCEQ will decommission the collocated PM_{10} monitor at the Texas City Fire Station site (AQS# 481670004) in 2017.
- The source-oriented PM_{10} metals speciation sampler at the Morrell site (AQS# 481130018) was decommissioned effective June 1, 2016, due to property owner request and shutdown of source.
- To meet the minimum collocation requirements, the TCEQ added a collocated $PM_{2.5}$ FRM monitor (method code 145, sampling every twelfth day) at the El Paso Chamizal site (AQS# 481410044), effective February 12, 2017.

- The TCEQ deployed $PM_{2.5}$ FRM monitors (method code 145, sampling every third day) at existing near-road stations in the Austin-Round Rock and San Antonio-New Braunfels CBSAs. The TCEQ deployed a new $PM_{2.5}$ FRM monitor to the San Antonio Interstate 35 site (AQS# 480291069) effective January 1, 2017, and relocated the $PM_{2.5}$ FRM monitor from the Austin Audubon Society site (AQS# 484530020) to the Austin North Interstate 35 near-road site (AQS# 484531068) effective January 7, 2017. The $PM_{2.5}$ FRM monitor from the Austin Audubon Society site (AQS# 484530020) was decommissioned effective January 20, 2017.
- $PM_{2.5}$ continuous FEM monitors (method code 209) were deployed to the following sites in 2017:
    - Austin Webberville Rd (AQS# 484530021) to meet collocation requirements for method code 209, effective April 27, 2017;
    - Bravo Big Bend (AQS# 480430101) effective May 5, 2017;
    - Baytown (AQS# 482010058) effective March 21, 2017, with the deactivation of the $PM_{2.5}$ FRM effective March 20, 2017; and
    - Hamshire (AQS# 482450022) effective May 16, 2017.
- Four continuous $PM_{2.5}$ TEOMs at the following sites were decommissioned due to catastrophic instrument failures:
    - Brownsville (AQS# 480610006), effective December 31, 2016;
    - Austin Webberville Rd (AQS# 484530021), effective September 19, 2016;
    - Baytown (AQS# 482010058), effective December 31, 2016; and
    - Hamshire (AQS# 482450022), effective December 31, 2016.
- Four continuous $PM_{2.5}$ TEOMs, designated as special purpose monitors, were decommissioned at the following sites:
    - Dallas Hinton (AQS# 481130069), effective December 31, 2015;
    - Kingwood (AQS# 482011042), effective December 31, 2016;
    - Italy (AQS# 481391044), effective December 6, 2016; and
    - Odessa Hays Elementary School (AQS# 481350003), effective December 31, 2016.
- The $PM_{2.5}$ Sunset carbon analyzer and $PM_{2.5}$ black carbon aethelometer special purpose monitors at Houston Deer Park #2 (AQS# 482011039) were decommissioned on December 31, 2016.
- The sampling frequency for the Texarkana New Boston (AQS# 480371031) $PM_{2.5}$ FRM monitor was changed from every third day to every sixth day on December 8, 2016.
- The TCEQ discontinued submitting average daily temperature and average daily pressure measurements from manual $PM_{2.5}$ samplers and average temperature and average pressure recorded at Pb sites to AQS effective April 30, 2016. The TCEQ will continue to submit these measurements applicable to the $PM_{2.5}$ Chemical Speciation Network as requested by the EPA in June 2017.
- The TCEQ decommissioned the entire Kingwood (AQS# 482011042) site, including surface meteorology (precipitation monitor), effective January 20, 2017.

2017 Proposed Network Changes

The following is a summary of proposed changes discussed in this year's assessment.

- The EPA recommended decommissioning the Brownsville site (AQS# 480610006) in the 2016 AMNP response letter due to concerns over siting criteria compliance. The site is now in compliance with all siting criteria. The TCEQ will decommission the O_3, TSP Pb, and CO monitors, and replace the $PM_{2.5}$ FRM sampler with a $PM_{2.5}$ FEM continuous monitor in 2017.
- The TCEQ will relocate the Lynchburg Ferry air monitoring site (AQS# 482011015) at the request of the property owner. The EPA approved the proposed new location, approximately 0.22 miles southeast at 4407 Independence Parkway, La Porte, Texas, in a letter dated March 9, 2017. All parameters at the current location were temporarily shut down on March 14, 2017. The new site location will contain the same monitoring equipment, including O_3, NO_2, solar radiation, wind speed, wind direction, and temperature, once the site preparation and electrical connections are complete. The AQS identification number and monitoring objectives remain the same.
- The TCEQ recommends relocating the NO_2 monitor at the Waco Mazanec site (AQS# 483091037) to the Killeen Skylark Field site (AQS# 480271047) in 2017.
- The TCEQ intends to deploy three additional special purpose SO_2 monitoring stations to characterize the ambient air in SO_2 nonattainment designated areas based on the evaluation of potentially viable monitoring locations outlined in Appendix E of this document.
- The TCEQ recommends to decommission the following SO_2 monitors exceeding minimum monitoring requirements:
    - El Paso UTEP (AQS# 481410037);
    - Houston Monroe (AQS# 482010062);
    - Houston North Wayside (AQS# 482010046);
    - Italy (AQS# 481391044);
    - Seabrook Friendship Park (AQS# 482011050); and
    - Skyline Park (AQS# 481410058).
- The TCEQ recommends to decommission the Laredo Vidaurri site (AQS# 484790016) TSP Pb monitor by December 31, 2017.
- The TCEQ recommends relocating the CO monitor at the Ascarate Park SE site (AQS# 481410055) to El Paso UTEP site in 2017, (AQS# 481410037) (in the El Paso CBSA).
- The TCEQ recommends to decommission the Laredo Bridge site CO monitor in the Laredo CBSA by December 31, 2017.
- The TCEQ will deploy $PM_{2.5}$ continuous FEM monitors (BAM-1022) to replace aging equipment at the following sites in 2017:
    - Brownsville (AQS# 480610006);
    - Houston East (AQS# 482011034);
    - SETRPC 42 Mauriceville (AQS# 483611100);
    - Mission (AQS# 482150043);

  - Port Arthur Memorial (AQS# 482450021); and
  - World Trade Bridge (AQS# 484790313).
- The TCEQ recommends to decommission the continuous $PM_{2.5}$ continuous monitors at the following sites:
  - Austin Audubon (AQS#484530020); and
  - Selma (AQS# 480290053).
- The TCEQ recommends to change the sampling frequency in accordance with PAMS requirements listed under 40 CFR Part 58, Appendix D, Section 5, to collect three, eight-hour carbonyl samples per day, every third day during ozone season, at the Clinton (AQS# 482011035) and at the Dallas Hinton site (AQS# 481130069).

CONCLUSION

After consideration of the federal regulations, 2016 U.S. Census Bureau population data, and 2016 design values, the TCEQ will meet or exceed all monitoring requirements with the above-mentioned recommendations for the next calendar year. This network plan focuses on the current network and changes within this network from July 1, 2016, through December 31, 2018.

Appendix A

Ambient Air Monitoring Network Site List

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
483751025	Amarillo 24th Avenue	4205 NE 24th Avenue, Amarillo	Amarillo, TX	35.236736	-101.787405	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
483751025	Amarillo 24th Avenue	4205 NE 24th Avenue, Amarillo	Amarillo, TX	35.236736	-101.787405	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
483751025	Amarillo 24th Avenue	4205 NE 24th Avenue, Amarillo	Amarillo, TX	35.236736	-101.787405	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
483750320	Amarillo A&M	6500 Amarillo Blvd West, Amarillo	Amarillo, TX	35.201592	-101.909275	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Urban Scale
483750024	Amarillo SH 136	7100 State Highway 136, Amarillo	Amarillo, TX	35.280273	-101.715640	Rural	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Middle Scale
483751077	Amarillo Xcel El Rancho	Folsom Rd. & El Rancho Rd., Amarillo	Amarillo, TX	35.316500	-101.741800	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
483751077	Amarillo Xcel El Rancho	Folsom Rd. & El Rancho Rd., Amarillo	Amarillo, TX	35.316500	-101.741800	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
483751077	Amarillo Xcel El Rancho	Folsom Rd. & El Rancho Rd., Amarillo	Amarillo, TX	35.316500	-101.741800	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	Dallas-Fort Worth-Arlington, TX	32.656357	-97.088585	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood
484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	Dallas-Fort Worth-Arlington, TX	32.656357	-97.088585	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	Dallas-Fort Worth-Arlington, TX	32.656357	-97.088585	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Highest Concentration	Neighborhood
484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	Dallas-Fort Worth-Arlington, TX	32.656357	-97.088585	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood
484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	Dallas-Fort Worth-Arlington, TX	32.656357	-97.088585	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	Dallas-Fort Worth-Arlington, TX	32.656357	-97.088585	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Barometric Pressure	PAMS/SLAMS	Barometer	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood

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481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Carbonyl	SPM	DNPH Silica HPLC	24 Hours; 1/6 Days	Max Ozone Concentration; Upwind Background	Neighborhood
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	CO	SLAMS	Gas Filter Correlation	Continuous	Highest Concentration	Urban Scale
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration; Upwind Background	Urban Scale
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Highest Concentration; Upwind Background	Neighborhood / Urban Scale
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Visibility	SPM	Visibility Sensor	Continuous	Highest Concentration; Population Exposure	Urban Scale
481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	El Paso, TX	31.746775	-106.402806	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	Austin-Round Rock, TX	30.483168	-97.872301	Rural	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	Austin-Round Rock, TX	30.483168	-97.872301	Rural	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	Austin-Round Rock, TX	30.483168	-97.872301	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous+A 1	Population Exposure	Neighborhood
484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	Austin-Round Rock, TX	30.483168	-97.872301	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	Austin-Round Rock, TX	30.483168	-97.872301	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	Austin-Round Rock, TX	30.483168	-97.872301	Rural	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Urban Scale
484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	Austin-Round Rock, TX	30.353860	-97.691660	Urban and Center City	CO	Near Road/SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	Austin-Round Rock, TX	30.353860	-97.691660	Urban and Center City	NO/NO2/NOx	Near Road/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact	Microscale
484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	Austin-Round Rock, TX	30.353860	-97.691660	Urban and Center City	PM2.5 (FRM)	Near Road/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Max Precursor Emissions Impact	Microscale
484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	Austin-Round Rock, TX	30.353860	-97.691660	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	Austin-Round Rock, TX	30.353860	-97.691660	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
484530014	Austin Northwest	3724 North Hills Dr, Austin	Austin-Round Rock, TX	30.354436	-97.760255	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Urban Scale
484530014	Austin Northwest	3724 North Hills Dr, Austin	Austin-Round Rock, TX	30.354436	-97.760255	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
484530014	Austin Northwest	3724 North Hills Dr, Austin	Austin-Round Rock, TX	30.354436	-97.760255	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
484530014	Austin Northwest	3724 North Hills Dr, Austin	Austin-Round Rock, TX	30.354436	-97.760255	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Urban Scale
484530014	Austin Northwest	3724 North Hills Dr, Austin	Austin-Round Rock, TX	30.354436	-97.760255	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
484530014	Austin Northwest	3724 North Hills Dr, Austin	Austin-Round Rock, TX	30.354436	-97.760255	Suburban	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	Austin-Round Rock, TX	30.263208	-97.712883	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	Austin-Round Rock, TX	30.263208	-97.712883	Urban and Center City	PM2.5 (FEM)	SLAMS/QA Collocated	Beta Attentuation	Continuous	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	Austin-Round Rock, TX	30.263208	-97.712883	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	Austin-Round Rock, TX	30.263208	-97.712883	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	Austin-Round Rock, TX	30.263208	-97.712883	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
482010058	Baytown	7210 1/2 Bayway Drive, Baytown	Houston-Sugar Land-Baytown, TX	29.770698	-95.031232	Suburban	PM2.5 (FEM)	SLAMS	Beta Attentuation	Continuous	Population Exposure	Middle Scale / Neighborhood
482010058	Baytown	7210 1/2 Bayway Drive, Baytown	Houston-Sugar Land-Baytown, TX	29.770698	-95.031232	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
482010058	Baytown	7210 1/2 Bayway Drive, Baytown	Houston-Sugar Land-Baytown, TX	29.770698	-95.031232	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	Houston-Sugar Land-Baytown, TX	29.823319	-94.983786	Suburban	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration	Neighborhood
482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	Houston-Sugar Land-Baytown, TX	29.823319	-94.983786	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	Houston-Sugar Land-Baytown, TX	29.823319	-94.983786	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	
482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	Houston-Sugar Land-Baytown, TX	29.823319	-94.983786	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	
482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	Houston-Sugar Land-Baytown, TX	29.823319	-94.983786	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	Beaumont-Port Arthur, TX	30.036422	-94.071061	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
482271072	Big Spring Midway	1218 N. Midway Rd, Big Spring	Big Spring, TX	32.280278	-101.407222	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
482271072	Big Spring Midway	1218 N. Midway Rd, Big Spring	Big Spring, TX	32.280278	-101.407222	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
482271072	Big Spring Midway	1218 N. Midway Rd, Big Spring	Big Spring, TX	32.280278	-101.407222	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482331073	Borger FM 1559	19440 FM 1559, Borger	Borger, TX	35.676200	-101.440100	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
482331073	Borger FM 1559	19440 FM 1559, Borger	Borger, TX	35.676200	-101.440100	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
482331073	Borger FM 1559	19440 FM 1559, Borger	Borger, TX	35.676200	-101.440100	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
480430101	Bravo Big Bend	Big Bend National Park, Big Bend Nat Park	None	29.302552	-103.177908	Rural	PM2.5 (FEM)	SPM	Beta Attentuation	Continuous	Regional Transport	Regional Scale
480430101	Bravo Big Bend	Big Bend National Park, Big Bend Nat Park	None	29.302552	-103.177908	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Microscale
480430101	Bravo Big Bend	Big Bend National Park, Big Bend Nat Park	None	29.302552	-103.177908	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Microscale
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	CO	SPM	Gas Filter Correlation	Continuous	Highest Concentration	Neighborhood
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Regional Scale
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	SVOC	SPM	HiVol PUF XAD GC-MS	24 Hours; 1/6 Days	Population Exposure; Upwind Background	Middle Scale
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure	Urban Scale
480610006	Brownsville	344 Porter Drive, Brownsville	Brownsville-Harlingen, TX	25.892518	-97.493830	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	San Antonio, TX	29.275381	-98.311692	Rural	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Source Oriented; Upwind Background	Urban Scale
480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	San Antonio, TX	29.275381	-98.311692	Rural	O3	SLAMS	UV Photometric	Continuous	Source Oriented; Upwind Background	Urban Scale
480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	San Antonio, TX	29.275381	-98.311692	Rural	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure; Upwind Background	Urban Scale
480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	San Antonio, TX	29.275381	-98.311692	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Regional Transport; Source Oriented	Regional Scale
480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	San Antonio, TX	29.275381	-98.311692	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure; Source Oriented	Neighborhood
480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	San Antonio, TX	29.275381	-98.311692	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Source Oriented	Urban Scale
480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	San Antonio, TX	29.275381	-98.311692	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Urban Scale
480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	San Antonio, TX	29.632058	-98.564936	Rural	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Urban Scale
480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	San Antonio, TX	29.632058	-98.564936	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Urban Scale

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480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	San Antonio, TX	29.632058	-98.564936	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Urban Scale
480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	San Antonio, TX	29.632058	-98.564936	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Urban Scale
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration	Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Population Exposure	Middle Scale / Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Population Exposure	Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Population Exposure	Neighborhood
482010026	Channelview	1405 Sheldon Road, Channelview	Houston-Sugar Land-Baytown, TX	29.802707	-95.125495	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
482510003	Cleburne Airport	1650 Airport Drive, Cleburne	Dallas-Fort Worth-Arlington, TX	32.353595	-97.436742	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
482510003	Cleburne Airport	1650 Airport Drive, Cleburne	Dallas-Fort Worth-Arlington, TX	32.353595	-97.436742	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Highest Concentration	Neighborhood
482510003	Cleburne Airport	1650 Airport Drive, Cleburne	Dallas-Fort Worth-Arlington, TX	32.353595	-97.436742	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
482510003	Cleburne Airport	1650 Airport Drive, Cleburne	Dallas-Fort Worth-Arlington, TX	32.353595	-97.436742	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Barometric Pressure	PAMS/SLAMS	Barometer	Continuous	Max Precursor Emissions Impact	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Carbonyl	PAMS/SLAMS	DNPH Silica HPLC	24 Hours; Seasonal, 3 Hours; Seasonal, 24 Hours; 1/6	Max Precursor Emissions Impact	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	CO (High Sensitivity)	PAMS/SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	PM10 (FRM)	QA Collocated/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Highest Concentration; Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/3 Days	Highest Concentration; Source Oriented	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/1 Days	Highest Concentration; Population Exposure; Source Oriented	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	PM2.5 (FRM)	QA Collocated/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Highest Concentration; Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Precipitation	SPM	Rain Gauge	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Highest Concentration; Population Exposure; Source Oriented	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Highest Concentration; Population Exposure; Source Oriented	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	UV Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
482011035	Clinton	9525 1/2 Clinton Dr, Houston	Houston-Sugar Land-Baytown, TX	29.733726	-95.257593	Urban and Center City	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
483390078	Conroe Relocated	9472A Hwy 1484, Conroe	Houston-Sugar Land-Baytown, TX	30.350302	-95.425128	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	General/Background; Population Exposure	Urban Scale
483390078	Conroe Relocated	9472A Hwy 1484, Conroe	Houston-Sugar Land-Baytown, TX	30.350302	-95.425128	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	General/Background; Population Exposure	Urban Scale
483390078	Conroe Relocated	9472A Hwy 1484, Conroe	Houston-Sugar Land-Baytown, TX	30.350302	-95.425128	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	General/Background	Neighborhood
483390078	Conroe Relocated	9472A Hwy 1484, Conroe	Houston-Sugar Land-Baytown, TX	30.350302	-95.425128	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Highest Concentration	Neighborhood
483390078	Conroe Relocated	9472A Hwy 1484, Conroe	Houston-Sugar Land-Baytown, TX	30.350302	-95.425128	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
483390078	Conroe Relocated	9472A Hwy 1484, Conroe	Houston-Sugar Land-Baytown, TX	30.350302	-95.425128	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
481130050	Convention Center	717 South Akard, Dallas	Dallas-Fort Worth-Arlington, TX	32.774262	-96.797686	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481130050	Convention Center	717 South Akard, Dallas	Dallas-Fort Worth-Arlington, TX	32.774262	-96.797686	Urban and Center City	PM10 (FRM)	QA Collocated/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481130050	Convention Center	717 South Akard, Dallas	Dallas-Fort Worth-Arlington, TX	32.774262	-96.797686	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Highest Concentration; Population Exposure	Neighborhood
481130050	Convention Center	717 South Akard, Dallas	Dallas-Fort Worth-Arlington, TX	32.774262	-96.797686	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481130050	Convention Center	717 South Akard, Dallas	Dallas-Fort Worth-Arlington, TX	32.774262	-96.797686	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
484491078	Cookville FM 4855	385 CR 4855, Not In A City	Mount Pleasant, TX	33.075200	-94.847400	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
484491078	Cookville FM 4855	385 CR 4855, Not In A City	Mount Pleasant, TX	33.075200	-94.847400	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
484491078	Cookville FM 4855	385 CR 4855, Not In A City	Mount Pleasant, TX	33.075200	-94.847400	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	Corpus Christi, TX	27.804505	-97.431582	Urban and Center City	PM2.5 (FRM)	QA Collocated/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	Corpus Christi, TX	27.804505	-97.431582	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Neighborhood
483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	Corpus Christi, TX	27.804505	-97.431582	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Highest Concentration; Population Exposure	Neighborhood
483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	Corpus Christi, TX	27.804505	-97.431582	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Middle Scale
483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	Corpus Christi, TX	27.804505	-97.431582	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Middle Scale
483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	Corpus Christi, TX	27.832409	-97.555380	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	Corpus Christi, TX	27.832409	-97.555380	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	Corpus Christi, TX	27.832409	-97.555380	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	Corpus Christi, TX	27.832409	-97.555380	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	Corpus Christi, TX	27.765340	-97.434262	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	Corpus Christi, TX	27.765340	-97.434262	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	Corpus Christi, TX	27.765340	-97.434262	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Neighborhood
483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	Corpus Christi, TX	27.765340	-97.434262	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	Corpus Christi, TX	27.765340	-97.434262	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
483491051	Corsicana Airport	Corsicana Airport, Corsicana	Corsicana, TX	32.031934	-96.399141	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Source Oriented	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Carbonyl	PAMS/SLAMS	DNPH Silica HPLC	3 Hours; Seasonal, 24 Hours; Seasonal	Max Precursor Emissions Impact	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	CO (High Sensitivity)	NCORE/PAMS/SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	NOy (High Sensitivity)	NCORE/SLAMS	Chemiluminescence	Continuous	Highest Concentration	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	O3	NCORE/PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	PM10-2.5	NCORE/SLAMS	Beta Attentuation	Continuous	Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	PM2.5 (FEM)	NCORE/SLAMS	Beta Attentuation	Continuous	Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	PM2.5 (FRM)	NCORE/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/1 Days	Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	PM2.5 (FRM)	QA Collocated/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	PM2.5 (Speciation)	Csn Stn/SLAMS	Carbons | Elements | Ions | Sequential Non-FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Relative Humidity	NCORE/PAMS/SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	SO2 (High Sensitivity)	NCORE/SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Highest Concentration; Max Precursor Emissions Impact	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Speciated VOC (Canister)	PAMS/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Max Precursor Emissions Impact	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Highest Concentration; Max Precursor Emissions Impact	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Visibility	SPM	Visibility Sensor	Continuous	Population Exposure	Neighborhood
481130069	Dallas Hinton	1415 Hinton Street, Dallas	Dallas-Fort Worth-Arlington, TX	32.820061	-96.860117	Urban and Center City	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
481131067	Dallas LBJ Freeway	8652 LBJ Freeway, Dallas	Dallas-Fort Worth-Arlington, TX	32.921180	-96.753550	Urban and Center City	NO/NO2/NOx	Near Road/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact	Microscale
481131067	Dallas LBJ Freeway	8652 LBJ Freeway, Dallas	Dallas-Fort Worth-Arlington, TX	32.921180	-96.753550	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
481131067	Dallas LBJ Freeway	8652 LBJ Freeway, Dallas	Dallas-Fort Worth-Arlington, TX	32.921180	-96.753550	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
481130075	Dallas North #2	12532 1/2 Nuestra Drive, Dallas	Dallas-Fort Worth-Arlington, TX	32.919206	-96.808498	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood
481130075	Dallas North #2	12532 1/2 Nuestra Drive, Dallas	Dallas-Fort Worth-Arlington, TX	32.919206	-96.808498	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
481130075	Dallas North #2	12532 1/2 Nuestra Drive, Dallas	Dallas-Fort Worth-Arlington, TX	32.919206	-96.808498	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481130075	Dallas North #2	12532 1/2 Nuestra Drive, Dallas	Dallas-Fort Worth-Arlington, TX	32.919206	-96.808498	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
481130075	Dallas North #2	12532 1/2 Nuestra Drive, Dallas	Dallas-Fort Worth-Arlington, TX	32.919206	-96.808498	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
481130075	Dallas North #2	12532 1/2 Nuestra Drive, Dallas	Dallas-Fort Worth-Arlington, TX	32.919206	-96.808498	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
481130087	Dallas Redbird Airport Executive	3277 W Redbird Lane, Dallas	Dallas-Fort Worth-Arlington, TX	32.676451	-96.872060	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood
481130087	Dallas Redbird Airport Executive	3277 W Redbird Lane, Dallas	Dallas-Fort Worth-Arlington, TX	32.676451	-96.872060	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
481130087	Dallas Redbird Airport Executive	3277 W Redbird Lane, Dallas	Dallas-Fort Worth-Arlington, TX	32.676451	-96.872060	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
481130087	Dallas Redbird Airport Executive	3277 W Redbird Lane, Dallas	Dallas-Fort Worth-Arlington, TX	32.676451	-96.872060	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Ozone Concentration; Population Exposure	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	NOy (High Sensitivity)	PAMS/SLAMS	Chemiluminescence	Continuous	Max Ozone Concentration; Population Exposure	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	Precipitation	PAMS/SLAMS	Rain Gauge	Continuous	Max Ozone Concentration	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	Speciated VOC (Canister)	PAMS/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Max Ozone Concentration; Population Exposure	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Urban Scale
481210034	Denton Airport South	Denton Airport South, Denton	Dallas-Fort Worth-Arlington, TX	33.219069	-97.196284	Rural	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Urban Scale
483550034	Dona Park	5707 Up River Rd, Corpus Christi	Corpus Christi, TX	27.811817	-97.465703	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
483550034	Dona Park	5707 Up River Rd, Corpus Christi	Corpus Christi, TX	27.811817	-97.465703	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
483550034	Dona Park	5707 Up River Rd, Corpus Christi	Corpus Christi, TX	27.811817	-97.465703	Urban and Center City	PM2.5 (Speciation)	Csn Supplemental/SLAMS	Carbons | Elements | Ions | Sequential FRM Gravimetric | Sequential Non-FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	
483550034	Dona Park	5707 Up River Rd, Corpus Christi	Corpus Christi, TX	27.811817	-97.465703	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Urban Scale
483550034	Dona Park	5707 Up River Rd, Corpus Christi	Corpus Christi, TX	27.811817	-97.465703	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Regional Scale
483550034	Dona Park	5707 Up River Rd, Corpus Christi	Corpus Christi, TX	27.811817	-97.465703	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Regional Scale
484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	Dallas-Fort Worth-Arlington, TX	32.987891	-97.477175	Rural	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration	Neighborhood
484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	Dallas-Fort Worth-Arlington, TX	32.987891	-97.477175	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Middle Scale
484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	Dallas-Fort Worth-Arlington, TX	32.987891	-97.477175	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Middle Scale
484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	Dallas-Fort Worth-Arlington, TX	32.987891	-97.477175	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Middle Scale
483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	Eagle Pass, TX	28.704607	-100.451156	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Regional Scale
483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	Eagle Pass, TX	28.704607	-100.451156	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Regional Transport	Regional Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	Eagle Pass, TX	28.704607	-100.451156	Urban and Center City	Visibility	SPM	Visibility Sensor	Continuous	Regional Transport	Regional Scale
483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	Eagle Pass, TX	28.704607	-100.451156	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Regional Scale
481130061	Earhart	3434 Bickers (Earhart Elem School), Dallas	Dallas-Fort Worth-Arlington, TX	32.785359	-96.876571	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	McAllen-Edinburg-Mission, TX	26.288622	-98.152066	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Regional Scale
482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	McAllen-Edinburg-Mission, TX	26.288622	-98.152066	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Regional Scale
482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	McAllen-Edinburg-Mission, TX	26.288622	-98.152066	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Regional Scale
482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	McAllen-Edinburg-Mission, TX	26.288622	-98.152066	Urban and Center City	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Regional Scale
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	CO (High Sensitivity)	NCORE/SLAMS	Gas Filter Correlation	Continuous	Highest Concentration	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Highest Concentration; Max Precursor Emissions Impact	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	NO/NO2/NOx	NCORE/PAMS/SLAMS	Chemiluminescence	Continuous	Highest Concentration; Max Precursor Emissions Impact	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	NOy (High Sensitivity)	NCORE/SLAMS	Chemiluminescence	Continuous	Highest Concentration	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	O3	NCORE/PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	PM10-2.5	NCORE/SLAMS	Beta Attentuation	Continuous	Highest Concentration; Population Exposure	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	PM2.5 (FEM)	NCORE/SLAMS	Beta Attentuation	Continuous	Highest Concentration; Population Exposure	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Highest Concentration; Population Exposure	Neighborhood

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481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	PM2.5 (Speciation)	Csn Stn/SLAMS	Carbons | Elements | Ions | Sequential Non-FRM Gravimetric	24 Hours; 1/3 Days	Highest Concentration	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	SO2 (High Sensitivity)	NCORE/SLAMS	Pulsed Fluorescence	Continuous	Highest Concentration	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Highest Concentration; Max Precursor Emissions Impact	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Highest Concentration; Max Precursor Emissions Impact	Neighborhood
481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	El Paso, TX	31.765685	-106.455227	Urban and Center City	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	General/Background; Population Exposure	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Highest Concentration	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	Precipitation	PAMS/SLAMS	Rain Gauge	Continuous	Max Ozone Concentration	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	TSP (Pb)	SLAMS	HiVol ICP-AES	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	UV Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
481410037	El Paso UTEP	250 Rim Rd, El Paso	El Paso, TX	31.768291	-106.501260	Urban and Center City	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Neighborhood
481490001	Fayette County	636 Roznov Rd, Round Top	AUSTIN-SAN MARCOS, TX	29.962475	-96.745875	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Regional Transport; Source Oriented	Regional Scale
484391053	Fort Worth California Parkway North	1198 California Parkway North,	Dallas-Fort Worth-Arlington, TX	32.664722	-97.338056	Urban and Center City	CO	Near Road/SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
484391053	Fort Worth California Parkway North	1198 California Parkway North,	Dallas-Fort Worth-Arlington, TX	32.664722	-97.338056	Urban and Center City	NO/NO2/NOx	Near Road/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact	Microscale
484391053	Fort Worth California Parkway North	1198 California Parkway North,	Dallas-Fort Worth-Arlington, TX	32.664722	-97.338056	Urban and Center City	PM2.5 (FRM)	Near Road/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Max Precursor Emissions Impact	Microscale
484391053	Fort Worth California Parkway North	1198 California Parkway North,	Dallas-Fort Worth-Arlington, TX	32.664722	-97.338056	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
484391053	Fort Worth California Parkway North	1198 California Parkway North,	Dallas-Fort Worth-Arlington, TX	32.664722	-97.338056	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Carbonyl	SPM	DNPH Silica HPLC	24 Hours; 1/6 Days	Max Precursor Emissions Impact	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Middle Scale
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood

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484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Speciated VOC (Canister)	PAMS/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Max Precursor Emissions Impact; Population Exposure	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.805818	-97.356568	Urban and Center City	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
480290060	Frank Wing Municipal Court	401 South Frio St, San Antonio	San Antonio, TX	29.422183	-98.505381	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Middle Scale
483951076	Franklin Oak Grove	8127 Oak Grove Road, Franklin	College Station-Bryan, TX	31.168889	-96.481944	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
483951076	Franklin Oak Grove	8127 Oak Grove Road, Franklin	College Station-Bryan, TX	31.168889	-96.481944	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
483951076	Franklin Oak Grove	8127 Oak Grove Road, Franklin	College Station-Bryan, TX	31.168889	-96.481944	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
480850005	Frisco	6590 Hillcrest Road, Frisco	Dallas-Fort Worth-Arlington, TX	33.132400	-96.786419	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
480850005	Frisco	6590 Hillcrest Road, Frisco	Dallas-Fort Worth-Arlington, TX	33.132400	-96.786419	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
480850005	Frisco	6590 Hillcrest Road, Frisco	Dallas-Fort Worth-Arlington, TX	33.132400	-96.786419	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Urban Scale
480850005	Frisco	6590 Hillcrest Road, Frisco	Dallas-Fort Worth-Arlington, TX	33.132400	-96.786419	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Urban Scale
480850003	Frisco 5th St	7471 South 5th Street, Frisco	Dallas-Fort Worth-Arlington, TX	33.142336	-96.824683	Suburban	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Middle Scale
480850007	Frisco 7	6931 Ash Street, Frisco	Dallas-Fort Worth-Arlington, TX	33.147414	-96.825769	Suburban	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood
480850009	Frisco Eubanks	6601 Eubanks, Frisco	Dallas-Fort Worth-Arlington, TX	33.144662	-96.828809	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure; Source Oriented	Neighborhood
480850009	Frisco Eubanks	6601 Eubanks, Frisco	Dallas-Fort Worth-Arlington, TX	33.144662	-96.828809	Suburban	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood
480850009	Frisco Eubanks	6601 Eubanks, Frisco	Dallas-Fort Worth-Arlington, TX	33.144662	-96.828809	Suburban	TSP (Pb)	QA Collocated/SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood
480850009	Frisco Eubanks	6601 Eubanks, Frisco	Dallas-Fort Worth-Arlington, TX	33.144662	-96.828809	Suburban	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	
480850029	Frisco Stonebrook	7202 Stonebrook Parkway, Frisco	Dallas-Fort Worth-Arlington, TX	33.136025	-96.824473	Urban and Center City	TSP (Pb)	SPM	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	Dew Point	SPM	Derived at site	Continuous	General/Background; Upwind Background	Middle Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	General/Background; Upwind Background	Middle Scale / Urban Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	PM2.5 (FRM)	SPM	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Regional Transport	Regional Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Regional Transport	Regional Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	Houston-Sugar Land-Baytown, TX	29.254474	-94.861289	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
482210001	Granbury	200 N Gordon Street, Granbury	Dallas-Fort Worth-Arlington, TX (Granbury, TX*)	32.442304	-97.803529	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482210001	Granbury	200 N Gordon Street, Granbury	Granbury, TX	32.442304	-97.803529	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Middle Scale
482210001	Granbury	200 N Gordon Street, Granbury	Granbury, TX	32.442304	-97.803529	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Middle Scale
482210001	Granbury	200 N Gordon Street, Granbury	Granbury, TX	32.442304	-97.803529	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Middle Scale
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	Barometric Pressure	PAMS/SLAMS	Barometer	Continuous	Max Ozone Concentration	Neighborhood
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration; Max Ozone Concentration	Neighborhood
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration	Neighborhood
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	Speciated VOC (Canister)	PAMS/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Max Ozone Concentration; Population Exposure	Neighborhood
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	Dallas-Fort Worth-Arlington, TX	32.984260	-97.063721	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Neighborhood
482311006	Greenville	824 Sayle Street, Greenville	Dallas-Fort Worth-Arlington, TX	33.153088	-96.115572	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure; Upwind Background	Neighborhood
482311006	Greenville	824 Sayle Street, Greenville	Dallas-Fort Worth-Arlington, TX	33.153088	-96.115572	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure; Upwind Background	Neighborhood
482311006	Greenville	824 Sayle Street, Greenville	Dallas-Fort Worth-Arlington, TX	33.153088	-96.115572	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
482311006	Greenville	824 Sayle Street, Greenville	Dallas-Fort Worth-Arlington, TX	33.153088	-96.115572	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
482311006	Greenville	824 Sayle Street, Greenville	Dallas-Fort Worth-Arlington, TX	33.153088	-96.115572	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482031079	Hallsville Red Oak Road	9206 Red Oak Road, Hallsville	Marshall, TX	32.470200	-94.481500	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
482031079	Hallsville Red Oak Road	9206 Red Oak Road, Hallsville	Marshall, TX	32.470200	-94.481500	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
482031079	Hallsville Red Oak Road	9206 Red Oak Road, Hallsville	Marshall, TX	32.470200	-94.481500	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482450022	Hamshire	12552 Second St, Not In A City	Beaumont-Port Arthur, TX	29.863957	-94.317802	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	General/Background; Regional Transport	Neighborhood / Urban Scale
482450022	Hamshire	12552 Second St, Not In A City	Beaumont-Port Arthur, TX	29.863957	-94.317802	Suburban	O3	SLAMS	UV Photometric	Continuous	General/Background; Regional Transport	Urban Scale
482450022	Hamshire	12552 Second St, Not In A City	Beaumont-Port Arthur, TX	29.863957	-94.317802	Suburban	PM2.5 (FEM)	SPM	Beta Attentuation	Continuous	Population Exposure	Neighborhood
482450022	Hamshire	12552 Second St, Not In A City	Beaumont-Port Arthur, TX	29.863957	-94.317802	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
482450022	Hamshire	12552 Second St, Not In A City	Beaumont-Port Arthur, TX	29.863957	-94.317802	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
482450022	Hamshire	12552 Second St, Not In A City	Beaumont-Port Arthur, TX	29.863957	-94.317802	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
480611023	Harlingen Teege	1602 W Teege Avenue, Harlingen	Brownsville-Harlingen, TX	26.200335	-97.712684	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
480611023	Harlingen Teege	1602 W Teege Avenue, Harlingen	Brownsville-Harlingen, TX	26.200335	-97.712684	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
480611023	Harlingen Teege	1602 W Teege Avenue, Harlingen	Brownsville-Harlingen, TX	26.200335	-97.712684	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
484391006	Haws Athletic Center	600 1/2 Congress St, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.759143	-97.342334	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Highest Concentration; Population Exposure	Neighborhood
484391006	Haws Athletic Center	600 1/2 Congress St, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.759143	-97.342334	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Highest Concentration	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	Barometric Pressure	PAMS/SLAMS	Barometer	Continuous	Max Ozone Concentration	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Urban Scale
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	NOy (High Sensitivity)	PAMS/SLAMS	Chemiluminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Middle Scale
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	PM2.5 (Speciation)	SPM	Carbons | Elements | Ions | Sequential FRM Gravimetric | Sequential Non-FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Neighborhood
482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	Houston-Sugar Land-Baytown, TX	29.901036	-95.326137	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Neighborhood
482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	Houston-Sugar Land-Baytown, TX	29.695729	-95.499219	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Middle Scale / Neighborhood
482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	Houston-Sugar Land-Baytown, TX	29.695729	-95.499219	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Middle Scale
482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	Houston-Sugar Land-Baytown, TX	29.695729	-95.499219	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background; Max Precursor Emissions Impact	Middle Scale
482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	Houston-Sugar Land-Baytown, TX	29.695729	-95.499219	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background; Max Precursor Emissions Impact	Middle Scale
482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	Houston-Sugar Land-Baytown, TX	29.695729	-95.499219	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background; Max Precursor Emissions Impact	Middle Scale
482010051	Houston Croquet	13826 1/2 Croquet, Houston	Houston-Sugar Land-Baytown, TX	29.623889	-95.474167	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482010051	Houston Croquet	13826 1/2 Croquet, Houston	Houston-Sugar Land-Baytown, TX	29.623889	-95.474167	Suburban	SO2	SPM	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
482010051	Houston Croquet	13826 1/2 Croquet, Houston	Houston-Sugar Land-Baytown, TX	29.623889	-95.474167	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
482010051	Houston Croquet	13826 1/2 Croquet, Houston	Houston-Sugar Land-Baytown, TX	29.623889	-95.474167	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Carbonyl	NATTS/PAMS/SLAMS	DNPH Silica HPLC	24 Hours; 1/6 Days	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	CO (High Sensitivity)	NCORE/SLAMS	Gas Filter Correlation	Continuous	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Population Exposure; Source Oriented	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	NOy (High Sensitivity)	NCORE/SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	O3	NCORE/PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM10 (FRM)	QA Collocated/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Max Precursor Emissions Impact; Population Exposure; Source Oriented	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM10 (Speciation)	QA Collocated/NATTS/ SLAMS	ICP-MS	24 Hours; 1/6 Days	Population Exposure	
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM10 (Speciation)	NATTS/SLAMS	ICP-MS	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM10-2.5	NCORE/SLAMS	Beta Attentuation	Continuous	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM2.5 (FEM)	NCORE/SLAMS	Beta Attentuation	Continuous	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM2.5 (FRM)	NCORE/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM2.5 (Speciation)	Csn Stn/SLAMS	Carbons | Elements | Ions | Sequential Non-FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM2.5 (Speciation)	QA Collocated/SLAMS	Carbons | Elements | Ions | Sequential Non-FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Relative Humidity	NCORE/PAMS/SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	SO2 (High Sensitivity)	NCORE/SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Speciated VOC (Canister)	NATTS/QA Collocated/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Speciated VOC (Canister)	NATTS/PAMS/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	SVOC	QA Collocated/SLAMS	HiVol PUF XAD GC-MS	24 Hours; 1/6 Days	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	SVOC	NATTS/SLAMS	HiVol PUF XAD GC-MS	24 Hours; 1/6 Days	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	Houston-Sugar Land-Baytown, TX	29.670025	-95.128508	Urban and Center City	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
482011034	Houston East	1262 1/2 Mae Drive, Houston	Houston-Sugar Land-Baytown, TX	29.767997	-95.220582	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Highest Concentration; Population Exposure	Middle Scale / Neighborhood
482011034	Houston East	1262 1/2 Mae Drive, Houston	Houston-Sugar Land-Baytown, TX	29.767997	-95.220582	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482011034	Houston East	1262 1/2 Mae Drive, Houston	Houston-Sugar Land-Baytown, TX	29.767997	-95.220582	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
482011034	Houston East	1262 1/2 Mae Drive, Houston	Houston-Sugar Land-Baytown, TX	29.767997	-95.220582	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
482011034	Houston East	1262 1/2 Mae Drive, Houston	Houston-Sugar Land-Baytown, TX	29.767997	-95.220582	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
482010060	Houston Kirkpatrick	5565 Kirkpatrick, Houston	Houston-Sugar Land-Baytown, TX	29.807415	-95.293622	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482010060	Houston Kirkpatrick	5565 Kirkpatrick, Houston	Houston-Sugar Land-Baytown, TX	29.807415	-95.293622	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
482010062	Houston Monroe	9726 1/2 Monroe, Houston	Houston-Sugar Land-Baytown, TX	29.625556	-95.267222	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482010062	Houston Monroe	9726 1/2 Monroe, Houston	Houston-Sugar Land-Baytown, TX	29.625556	-95.267222	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482010062	Houston Monroe	9726 1/2 Monroe, Houston	Houston-Sugar Land-Baytown, TX	29.625556	-95.267222	Suburban	Precipitation	SPM	Rain Gauge	Continuous	General/Background	Neighborhood
482010062	Houston Monroe	9726 1/2 Monroe, Houston	Houston-Sugar Land-Baytown, TX	29.625556	-95.267222	Suburban	SO2	SPM	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
482011052	Houston North Loop	822 North Loop, Houston	Houston-Sugar Land-Baytown, TX	29.814530	-95.387690	Urban and Center City	CO	Near Road/SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
482011052	Houston North Loop	822 North Loop, Houston	Houston-Sugar Land-Baytown, TX	29.814530	-95.387690	Urban and Center City	NO/NO2/NOx	Near Road/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact	Microscale
482011052	Houston North Loop	822 North Loop, Houston	Houston-Sugar Land-Baytown, TX	29.814530	-95.387690	Urban and Center City	PM2.5 (FRM)	Near Road/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Max Precursor Emissions Impact	Microscale
482011052	Houston North Loop	822 North Loop, Houston	Houston-Sugar Land-Baytown, TX	29.814530	-95.387690	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
482011052	Houston North Loop	822 North Loop, Houston	Houston-Sugar Land-Baytown, TX	29.814530	-95.387690	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
482010046	Houston North Wayside	7330 1/2 North Wayside, Houston	Houston-Sugar Land-Baytown, TX	29.828086	-95.284096	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482010046	Houston North Wayside	7330 1/2 North Wayside, Houston	Houston-Sugar Land-Baytown, TX	29.828086	-95.284096	Suburban	SO2	SPM	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
482011066	Houston Southwest Freeway	5617 Westward Avenue, Houston	Houston-Sugar Land-Baytown, TX	29.721600	-95.492650	Urban and Center City	NO/NO2/NOx	Near Road/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact	Microscale
482011066	Houston Southwest Freeway	5617 Westward Avenue, Houston	Houston-Sugar Land-Baytown, TX	29.721600	-95.492650	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
482011066	Houston Southwest Freeway	5617 Westward Avenue, Houston	Houston-Sugar Land-Baytown, TX	29.721600	-95.492650	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	Houston-Sugar Land-Baytown, TX	29.723333	-95.635833	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	Houston-Sugar Land-Baytown, TX	29.723333	-95.635833	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	Houston-Sugar Land-Baytown, TX	29.723333	-95.635833	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	Houston-Sugar Land-Baytown, TX	29.723333	-95.635833	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
480612004	Isla Blanca Park	Lot B 69 1/2, South Padre Island	Brownsville-Harlingen, TX	26.069615	-97.162200	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Regional Transport	Urban Scale
480612004	Isla Blanca Park	Lot B 69 1/2, South Padre Island	Brownsville-Harlingen, TX	26.069615	-97.162200	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Regional Transport	Regional Scale
480612004	Isla Blanca Park	Lot B 69 1/2, South Padre Island	Brownsville-Harlingen, TX	26.069615	-97.162200	Rural	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Regional Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	Dew Point	SPM	Derived at site	Continuous	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	O3	PAMS/SLAMS	UV Photometric	Continuous	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	SO2	SPM	Pulsed Fluorescence	Continuous	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	Speciated VOC (Canister)	PAMS/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Upwind Background	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	UV Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Upwind Background	Urban Scale
481391044	Italy	900 FM 667 Ellis County, Italy	Dallas-Fort Worth-Arlington, TX	32.175417	-96.870189	Rural	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Upwind Background	Urban Scale
481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	El Paso, TX	31.785769	-106.323578	Suburban	O3	SPM	UV Photometric	Continuous	Population Exposure	Neighborhood
481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	El Paso, TX	31.785769	-106.323578	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	El Paso, TX	31.785769	-106.323578	Suburban	Relative Humidity	Border Grant/SLAMS	Humidity Sensor	Continuous	General/Background	Neighborhood
481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	El Paso, TX	31.785769	-106.323578	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	El Paso, TX	31.785769	-106.323578	Suburban	Wind	Border Grant/SLAMS	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482450018	Jefferson County Airport	End of 90th Street @ Jefferson County Airport, Port Arthur	Beaumont-Port Arthur, TX	29.942798	-94.000770	Suburban	Precipitation	PAMS/SLAMS	Rain Gauge	Continuous	General/Background	Neighborhood
482450018	Jefferson County Airport	End of 90th Street @ Jefferson County Airport, Port Arthur	Beaumont-Port Arthur, TX	29.942798	-94.000770	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	General/Background	Neighborhood
482450018	Jefferson County Airport	End of 90th Street @ Jefferson County Airport, Port Arthur	Beaumont-Port Arthur, TX	29.942798	-94.000770	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482511008	Johnson County Luisa	2420 Luisa Ln, Alvarado	Dallas-Fort Worth-Arlington, TX	32.469701	-97.169271	Suburban	Speciated VOC (Canister)	SPM	Canister GC-MS	24 Hours; 1/6 Days	Population Exposure	Neighborhood
482511008	Johnson County Luisa	2420 Luisa Ln, Alvarado	Dallas-Fort Worth-Arlington, TX	32.469701	-97.169271	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
482511008	Johnson County Luisa	2420 Luisa Ln, Alvarado	Dallas-Fort Worth-Arlington, TX	32.469701	-97.169271	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	Carbonyl	NATTS/SLAMS	DNPH Silica HPLC	24 Hours; 1/6 Days	General/Background	Regional Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	General/Background	Regional Scale / Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	O3	SLAMS	UV Photometric	Continuous	General/Background	Regional Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	PM10 (FRM)	SPM	HiVol Gravimetric	24 Hours; 1/6 Days	General/Background	Neighborhood
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	PM10 (Speciation)	NATTS/SLAMS	ICP-MS	24 Hours; 1/6 Days	General/Background	Regional Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	PM2.5 (FRM)	SPM	Sequential FRM Gravimetric	24 Hours; 1/6 Days	General/Background	Regional Scale / Urban Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	PM2.5 (Speciation)	Csn Supplemental/SLAMS	Carbons | Elements | Ions | Sequential Non-FRM Gravimetric	24 Hours; 1/3 Days	Regional Transport; General/Background	Regional Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Regional Transport; General/Background	Regional Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Urban Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	Speciated VOC (Canister)	NATTS/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	General/Background	Regional Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	SVOC	NATTS/SLAMS	HiVol PUF XAD GC-MS	24 Hours; 1/6 Days	General/Background	Regional Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Urban Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	Visibility	SPM	Visibility Sensor	Continuous	General/Background	Urban Scale
482030002	Karnack	Hwy 134 & Spur 449, Not In A City	Marshall, TX	32.668987	-94.167457	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Urban Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration	Neighborhood
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Population Exposure; Upwind Background	Neighborhood / Urban Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Population Exposure; Upwind Background	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Upwind Background	Regional Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Upwind Background	Urban Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure; Upwind Background	Urban Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Upwind Background	Urban Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Upwind Background	Urban Scale
482570005	Kaufman	3790 S Houston St, Kaufman	Dallas-Fort Worth-Arlington, TX	32.564968	-96.317687	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Upwind Background	Urban Scale
484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.922474	-97.282088	Suburban	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.922474	-97.282088	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Urban Scale
484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.922474	-97.282088	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Urban Scale
484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	Dallas-Fort Worth-Arlington, TX	32.922474	-97.282088	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Urban Scale
480271047	Killeen Skylark Field	1605 Stone Tree Drive, Killeen	Killeen-Temple-Fort Hood, TX	31.088002	-97.679734	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
480271047	Killeen Skylark Field	1605 Stone Tree Drive, Killeen	Killeen-Temple-Fort Hood, TX	31.088002	-97.679734	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
480271047	Killeen Skylark Field	1605 Stone Tree Drive, Killeen	Killeen-Temple-Fort Hood, TX	31.088002	-97.679734	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Urban Scale
482011043	La Porte Airport C243	La Porte Airport, 2434 Buchanan Street, La Porte	Houston-Sugar Land-Baytown, TX	29.672000	-95.064700	Suburban	Precipitation	PAMS/SLAMS	Rain Gauge	Continuous	General/Background	Neighborhood
482011043	La Porte Airport C243	La Porte Airport, 2434 Buchanan Street, La Porte	Houston-Sugar Land-Baytown, TX	29.672000	-95.064700	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	General/Background	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482011043	La Porte Airport C243	La Porte Airport, 2434 Buchanan Street, La Porte	Houston-Sugar Land-Baytown, TX	29.672000	-95.064700	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	Houston-Sugar Land-Baytown, TX	29.043759	-95.472946	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure; Source Oriented	Middle Scale / Neighborhood
480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	Houston-Sugar Land-Baytown, TX	29.043759	-95.472946	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure; Source Oriented	Neighborhood
480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	Houston-Sugar Land-Baytown, TX	29.043759	-95.472946	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Middle Scale
480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	Houston-Sugar Land-Baytown, TX	29.043759	-95.472946	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Middle Scale
480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	Houston-Sugar Land-Baytown, TX	29.043759	-95.472946	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Middle Scale
482010047	Lang	4401 1/2 Lang Rd, Houston	Houston-Sugar Land-Baytown, TX	29.834167	-95.489167	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Middle Scale / Urban Scale
482010047	Lang	4401 1/2 Lang Rd, Houston	Houston-Sugar Land-Baytown, TX	29.834167	-95.489167	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
482010047	Lang	4401 1/2 Lang Rd, Houston	Houston-Sugar Land-Baytown, TX	29.834167	-95.489167	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
484790017	Laredo Bridge	700 Zaragosa St, Laredo	Laredo, TX	27.501826	-99.502984	Urban and Center City	CO	Border Grant/SLAMS	Gas Filter Correlation	Continuous	Population Exposure; Source Oriented	Microscale
484790017	Laredo Bridge	700 Zaragosa St, Laredo	Laredo, TX	27.501826	-99.502984	Urban and Center City	PM10 (FRM)	Border Grant/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Highest Concentration	Microscale
484790017	Laredo Bridge	700 Zaragosa St, Laredo	Laredo, TX	27.501826	-99.502984	Urban and Center City	Speciated VOC (Canister)	Border Grant/SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Highest Concentration	Neighborhood
484790017	Laredo Bridge	700 Zaragosa St, Laredo	Laredo, TX	27.501826	-99.502984	Urban and Center City	Temperature (Outdoor)	Border Grant/SLAMS	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
484790017	Laredo Bridge	700 Zaragosa St, Laredo	Laredo, TX	27.501826	-99.502984	Urban and Center City	Wind	Border Grant/SLAMS	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	Laredo, TX	27.517449	-99.515219	Suburban	CO	Border Grant/SLAMS	Gas Filter Correlation	Continuous	Population Exposure	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	Laredo, TX	27.517449	-99.515219	Suburban	O3	Border Grant/SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	Laredo, TX	27.517449	-99.515219	Suburban	PM10 (FRM)	Border Grant/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	Laredo, TX	27.517449	-99.515219	Suburban	Temperature (Outdoor)	Border Grant/SLAMS	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	Laredo, TX	27.517449	-99.515219	Suburban	TSP (Pb)	Border Grant/SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure	Neighborhood
484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	Laredo, TX	27.517449	-99.515219	Suburban	Wind	Border Grant/SLAMS	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
481830001	Longview	Gregg Co Airport near Longview, Longview	Longview, TX	32.378682	-94.711811	Rural	NO/NO2/NOx	SPM	Chemiluminescence	Continuous	Population Exposure	Neighborhood
481830001	Longview	Gregg Co Airport near Longview, Longview	Longview, TX	32.378682	-94.711811	Rural	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
481830001	Longview	Gregg Co Airport near Longview, Longview	Longview, TX	32.378682	-94.711811	Rural	Precipitation	SPM	Rain Gauge	Continuous	General/Background	Neighborhood
481830001	Longview	Gregg Co Airport near Longview, Longview	Longview, TX	32.378682	-94.711811	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	General/Background; Population Exposure	Neighborhood
481830001	Longview	Gregg Co Airport near Longview, Longview	Longview, TX	32.378682	-94.711811	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
481830001	Longview	Gregg Co Airport near Longview, Longview	Longview, TX	32.378682	-94.711811	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
481830001	Longview	Gregg Co Airport near Longview, Longview	Longview, TX	32.378682	-94.711811	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
483031028	Lubbock 12th Street	3901 East 12th Street, Lubbock	Lubbock, TX	33.585530	-101.786980	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Urban Scale
483031028	Lubbock 12th Street	3901 East 12th Street, Lubbock	Lubbock, TX	33.585530	-101.786980	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Regional Scale
483031028	Lubbock 12th Street	3901 East 12th Street, Lubbock	Lubbock, TX	33.585530	-101.786980	Urban and Center City	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Regional Scale

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482011015	Lynchburg Ferry	4407 Independence Parkway South, Baytown	Houston-Sugar Land-Baytown, TX	29.761653	-95.081386	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Source Oriented	Middle Scale / Neighborhood
482011015	Lynchburg Ferry	4407 Independence Parkway South, Baytown	Houston-Sugar Land-Baytown, TX	29.761653	-95.081386	Suburban	O3	SLAMS	UV Photometric	Continuous	Source Oriented	Middle Scale
482011015	Lynchburg Ferry	4407 Independence Parkway South, Baytown	Houston-Sugar Land-Baytown, TX	29.761653	-95.081386	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood
482011015	Lynchburg Ferry	4407 Independence Parkway South, Baytown	Houston-Sugar Land-Baytown, TX	29.761653	-95.081386	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
482011015	Lynchburg Ferry	4407 Independence Parkway South, Baytown	Houston-Sugar Land-Baytown, TX	29.761653	-95.081386	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	Houston-Sugar Land-Baytown, TX	29.520443	-95.392509	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood / Urban Scale
480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	Houston-Sugar Land-Baytown, TX	29.520443	-95.392509	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	Houston-Sugar Land-Baytown, TX	29.520443	-95.392509	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	Houston-Sugar Land-Baytown, TX	29.520443	-95.392509	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Source Oriented	Neighborhood
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	PM2.5 (FRM)	SPM	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Microscale
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	PM2.5 (Speciation)	SPM	Carbons | Elements | Ions | Sequential FRM Gravimetric | Sequential Non-FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Source Oriented	Regional Scale
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	Dallas-Fort Worth-Arlington, TX	32.482083	-97.026899	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Urban Scale
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Urban Scale
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Urban Scale
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Microscale
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	SVOC	SPM	HiVol PUF XAD GC-MS	24 Hours; 1/6 Days	Population Exposure	Microscale
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Microscale
482150043	Mission	2300 North Glasscock, Mission	McAllen-Edinburg-Mission, TX	26.226210	-98.291069	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Microscale
482730314	National Seashore	20420 Park Road, Corpus Christi	Kingsville, TX	27.426981	-97.298692	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Regional Transport	Regional Scale
482730314	National Seashore	20420 Park Road, Corpus Christi	Kingsville, TX	27.426981	-97.298692	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Regional Transport	Regional Scale
482730314	National Seashore	20420 Park Road, Corpus Christi	Kingsville, TX	27.426981	-97.298692	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Regional Scale
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	Barometric Pressure	PAMS/SLAMS	Barometer	Continuous	Max Precursor Emissions Impact	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	CO (High Sensitivity)	PAMS/SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	Speciated VOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	TNMOC (AutoGC)	PAMS/SLAMS	AutoGC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	UV Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
482451035	Nederland High School	1800 N. 18th Street, Nederland	Beaumont-Port Arthur, TX	29.978926	-94.010872	Suburban	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
482010029	Northwest Harris County	16822 Kitzman, Tomball	Houston-Sugar Land-Baytown, TX	30.039524	-95.673951	Rural	Dew Point	SPM	Derived at site	Continuous	Source Oriented	Microscale
482010029	Northwest Harris County	16822 Kitzman, Tomball	Houston-Sugar Land-Baytown, TX	30.039524	-95.673951	Rural	NO/NO2/NOx	PAMS/SLAMS	Chemiluminescence	Continuous	Extreme Downwind; Population Exposure; Upwind Background	Urban Scale
482010029	Northwest Harris County	16822 Kitzman, Tomball	Houston-Sugar Land-Baytown, TX	30.039524	-95.673951	Rural	O3	PAMS/SLAMS	UV Photometric	Continuous	Extreme Downwind; Population Exposure; Upwind Background	Urban Scale
482010029	Northwest Harris County	16822 Kitzman, Tomball	Houston-Sugar Land-Baytown, TX	30.039524	-95.673951	Rural	Relative Humidity	PAMS/SLAMS	Humidity Sensor	Continuous	Extreme Downwind; Upwind Background	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482010029	Northwest Harris County	16822 Kitzman, Tomball	Houston-Sugar Land-Baytown, TX	30.039524	-95.673951	Rural	Solar Radiation	PAMS/SLAMS	Photovoltaic	Continuous	Extreme Downwind; Upwind Background	Urban Scale
482010029	Northwest Harris County	16822 Kitzman, Tomball	Houston-Sugar Land-Baytown, TX	30.039524	-95.673951	Rural	Temperature (Outdoor)	PAMS/SLAMS	Aspirated Thermister	Continuous	Extreme Downwind; Upwind Background	Urban Scale
482010029	Northwest Harris County	16822 Kitzman, Tomball	Houston-Sugar Land-Baytown, TX	30.039524	-95.673951	Rural	Wind	PAMS/SLAMS	Potentiometer Cup Anemometer	Continuous	Extreme Downwind; Upwind Background	Urban Scale
481351014	Odessa Gonzales	2700 Disney, Odessa	Odessa, TX	31.870253	-102.334756	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Highest Concentration	Neighborhood
481351014	Odessa Gonzales	2700 Disney, Odessa	Odessa, TX	31.870253	-102.334756	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
481351014	Odessa Gonzales	2700 Disney, Odessa	Odessa, TX	31.870253	-102.334756	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	El Paso, TX	31.862470	-106.547300	Suburban	CO	SLAMS	Gas Filter Correlation	Continuous	Population Exposure	Neighborhood
481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	El Paso, TX	31.862470	-106.547300	Suburban	PM10 (FRM)	QA Collocated/SLAMS	HiVol Gravimetric	24 Hours; 1/12 Days	Population Exposure	Neighborhood
481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	El Paso, TX	31.862470	-106.547300	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	El Paso, TX	31.862470	-106.547300	Suburban	TSP (Pb)	SLAMS	HiVol ICP-AES	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	El Paso, TX	31.862470	-106.547300	Suburban	TSP (Pb)	QA Collocated/SLAMS	HiVol ICP-AES	24 Hours; 1/12 Days	Population Exposure	Neighborhood
481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	El Paso, TX	31.862470	-106.547300	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
480290677	Old Hwy 90	911 Old Hwy 90 West, San Antonio	San Antonio, TX	29.423944	-98.580499	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
483611083	Orange 1st Street	2239 1st Street, Orange	Beaumont-Port Arthur, TX	30.153675	-93.725897	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
483611083	Orange 1st Street	2239 1st Street, Orange	Beaumont-Port Arthur, TX	30.153675	-93.725897	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
483611083	Orange 1st Street	2239 1st Street, Orange	Beaumont-Port Arthur, TX	30.153675	-93.725897	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
480290676	Palo Alto	9011 Poteet Jourdanton Hwy, San Antonio	San Antonio, TX	29.332790	-98.551383	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
480290676	Palo Alto	9011 Poteet Jourdanton Hwy, San Antonio	San Antonio, TX	29.332790	-98.551383	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
480290676	Palo Alto	9011 Poteet Jourdanton Hwy, San Antonio	San Antonio, TX	29.332790	-98.551383	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	Barometric Pressure	SPM	Barometer	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	NO/NO2/NOx	SPM	Chemiluminescence	Continuous	Population Exposure	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	O3	SPM	UV Photometric	Continuous	Population Exposure	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	Precipitation	SPM	Rain Gauge	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	Relative Humidity	SPM	Humidity Sensor	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	SO2	SPM	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	UV Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
482010416	Park Place	7421 Park Place Blvd, Houston	Houston-Sugar Land-Baytown, TX	29.686389	-95.294722	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
483670081	Parker County	3033 New Authon Rd, Weatherford	Dallas-Fort Worth-Arlington, TX	32.868773	-97.905931	Rural	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
483670081	Parker County	3033 New Authon Rd, Weatherford	Dallas-Fort Worth-Arlington, TX	32.868773	-97.905931	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Source Oriented	Neighborhood
483670081	Parker County	3033 New Authon Rd, Weatherford	Dallas-Fort Worth-Arlington, TX	32.868773	-97.905931	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
483670081	Parker County	3033 New Authon Rd, Weatherford	Dallas-Fort Worth-Arlington, TX	32.868773	-97.905931	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Neighborhood
481211032	Pilot Point	792 E Northside Dr, Pilot Point	Dallas-Fort Worth-Arlington, TX	33.410648	-96.944590	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Regional Scale
481211032	Pilot Point	792 E Northside Dr, Pilot Point	Dallas-Fort Worth-Arlington, TX	33.410648	-96.944590	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Upwind Background	Regional Scale
481211032	Pilot Point	792 E Northside Dr, Pilot Point	Dallas-Fort Worth-Arlington, TX	33.410648	-96.944590	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Upwind Background	Regional Scale
481211032	Pilot Point	792 E Northside Dr, Pilot Point	Dallas-Fort Worth-Arlington, TX	33.410648	-96.944590	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Upwind Background	Regional Scale
482451071	Port Arthur 7th Street	7th Street / Texaco Island Road, Port Arthur	Beaumont-Port Arthur, TX	29.848550	-93.962194	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
482451071	Port Arthur 7th Street	7th Street / Texaco Island Road, Port Arthur	Beaumont-Port Arthur, TX	29.848550	-93.962194	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
482451071	Port Arthur 7th Street	7th Street / Texaco Island Road, Port Arthur	Beaumont-Port Arthur, TX	29.848550	-93.962194	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482450021	Port Arthur Memorial School	2200 Jefferson Drive, Port Arthur	Beaumont-Port Arthur, TX	29.922894	-93.909018		PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
482450011	Port Arthur West	623 Ellias Street, Port Arthur	Beaumont-Port Arthur, TX	29.897516	-93.991084	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482450011	Port Arthur West	623 Ellias Street, Port Arthur	Beaumont-Port Arthur, TX	29.897516	-93.991084	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
482450011	Port Arthur West	623 Ellias Street, Port Arthur	Beaumont-Port Arthur, TX	29.897516	-93.991084	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure; Source Oriented	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482450011	Port Arthur West	623 Ellias Street, Port Arthur	Beaumont-Port Arthur, TX	29.897516	-93.991084	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
482450011	Port Arthur West	623 Ellias Street, Port Arthur	Beaumont-Port Arthur, TX	29.897516	-93.991084	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure; Source Oriented	Neighborhood
483491081	Richland Southeast 1220 Road	Southeast 1220 Road, Richland	Corsicana, TX	31.904100	-96.352000	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
483491081	Richland Southeast 1220 Road	Southeast 1220 Road, Richland	Corsicana, TX	31.904100	-96.352000	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
483491081	Richland Southeast 1220 Road	Southeast 1220 Road, Richland	Corsicana, TX	31.904100	-96.352000	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
481410038	Riverside	301 Midway Dr (Riverside High School), El Paso	El Paso, TX	31.733800	-106.372100	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
483311075	Rockdale John D. Harper Road	3990 John D Harper Road, Rockdale	None	30.569444	-97.076111	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
483311075	Rockdale John D. Harper Road	3990 John D Harper Road, Rockdale	None	30.569444	-97.076111	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
483311075	Rockdale John D. Harper Road	3990 John D Harper Road, Rockdale	None	30.569444	-97.076111	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
483970001	Rockwall Heath	100 E Heath St, Rockwall	Dallas-Fort Worth-Arlington, TX	32.936523	-96.459211	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
483970001	Rockwall Heath	100 E Heath St, Rockwall	Dallas-Fort Worth-Arlington, TX	32.936523	-96.459211	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Neighborhood
483970001	Rockwall Heath	100 E Heath St, Rockwall	Dallas-Fort Worth-Arlington, TX	32.936523	-96.459211	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
483970001	Rockwall Heath	100 E Heath St, Rockwall	Dallas-Fort Worth-Arlington, TX	32.936523	-96.459211	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
480291080	San Antonio Gardner Road	7145 Gardner Road, San Antonio	San Antonio, TX	29.352911	-98.332814	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
480291080	San Antonio Gardner Road	7145 Gardner Road, San Antonio	San Antonio, TX	29.352911	-98.332814	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
480291080	San Antonio Gardner Road	7145 Gardner Road, San Antonio	San Antonio, TX	29.352911	-98.332814	Suburban	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	San Antonio, TX	29.529400	-98.391390	Urban and Center City	CO	Near Road/SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	San Antonio, TX	29.529400	-98.391390	Urban and Center City	NO/NO2/NOx	Near Road/SLAMS	Chemiluminescence	Continuous	Max Precursor Emissions Impact	Microscale
480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	San Antonio, TX	29.529400	-98.391390	Urban and Center City	PM2.5 (FRM)	Near Road/SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Max Precursor Emissions Impact	Microscale
480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	San Antonio, TX	29.529400	-98.391390	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	San Antonio, TX	29.529400	-98.391390	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	San Antonio, TX	29.515090	-98.620166	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood
480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	San Antonio, TX	29.515090	-98.620166	Suburban	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Urban Scale
480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	San Antonio, TX	29.515090	-98.620166	Suburban	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Urban Scale
480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	San Antonio, TX	29.515090	-98.620166	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Urban Scale
480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	San Antonio, TX	29.515090	-98.620166	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Urban Scale
480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	San Antonio, TX	29.515090	-98.620166	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Urban Scale
482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	Houston-Sugar Land-Baytown, TX	29.583047	-95.015544	Suburban	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Middle Scale / Neighborhood
482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	Houston-Sugar Land-Baytown, TX	29.583047	-95.015544	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	Houston-Sugar Land-Baytown, TX	29.583047	-95.015544	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Highest Concentration	Middle Scale

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	Houston-Sugar Land-Baytown, TX	29.583047	-95.015544	Suburban	SO2	SPM	Pulsed Fluorescence	Continuous	Population Exposure; Source Oriented	Neighborhood
482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	Houston-Sugar Land-Baytown, TX	29.583047	-95.015544	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Middle Scale
482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	Houston-Sugar Land-Baytown, TX	29.583047	-95.015544	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Middle Scale
482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	Houston-Sugar Land-Baytown, TX	29.583047	-95.015544	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Middle Scale
480290053	Selma	16289 North Evans Rd #2, Selma	San Antonio, TX	29.587741	-98.312512	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
480290053	Selma	16289 North Evans Rd #2, Selma	San Antonio, TX	29.587741	-98.312512	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
482450101	SETRPC 40 Sabine Pass	5200 Mechanic, Not In A City	Beaumont-Port Arthur, TX	29.727931	-93.894081	Rural	O3	PAMS/SLAMS	UV Photometric	Continuous	Max Ozone Concentration	Neighborhood
483611100	SETRPC 42 Mauriceville	Intersection of TX Hwys 62 & 12, Port Arthur	Beaumont-Port Arthur, TX	30.194558	-93.867237	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Regional Transport; Upwind Background	Regional Scale
482450102	SETRPC 43 Jefferson Co Airport	Jefferson County Airport, Port Arthur	Beaumont-Port Arthur, TX	29.942751	-94.000684	Suburban	O3	SPM	UV Photometric	Continuous	Max Precursor Emissions Impact	Middle Scale
481410058	Skyline Park	5050A Yvette Drive, El Paso	El Paso, TX	31.893913	-106.425827	Suburban	O3	Border Grant/SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
481410058	Skyline Park	5050A Yvette Drive, El Paso	El Paso, TX	31.893913	-106.425827	Suburban	SO2	Border Grant/SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
481410058	Skyline Park	5050A Yvette Drive, El Paso	El Paso, TX	31.893913	-106.425827	Suburban	Temperature (Outdoor)	Border Grant/SLAMS	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
481410058	Skyline Park	5050A Yvette Drive, El Paso	El Paso, TX	31.893913	-106.425827	Suburban	Wind	Border Grant/SLAMS	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
480710013	Smith Point Hawkins Camp	1850 Hawkins Camp Rd, Anahuac	Houston-Sugar Land-Baytown, TX	29.546244	-94.786969	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
480710013	Smith Point Hawkins Camp	1850 Hawkins Camp Rd, Anahuac	Houston-Sugar Land-Baytown, TX	29.546244	-94.786969	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Neighborhood

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	El Paso, TX	31.667500	-106.288000	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	El Paso, TX	31.667500	-106.288000	Suburban	PM10 (FRM)	Border Grant/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	General/Background; Population Exposure	Neighborhood
481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	El Paso, TX	31.667500	-106.288000	Suburban	PM10 (FRM)	Border Grant/QA Collocated/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	El Paso, TX	31.667500	-106.288000	Suburban	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	El Paso, TX	31.667500	-106.288000	Suburban	SVOC	SPM	HiVol PUF XAD GC-MS	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	El Paso, TX	31.667500	-106.288000	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	El Paso, TX	31.667500	-106.288000	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
484393010	Stage Coach	8900 West Freeway, White Settlement	Dallas-Fort Worth-Arlington, TX	32.739200	-97.470330	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
480271045	Temple Georgia	8406 Georgia Avenue, Temple	Killeen-Temple-Fort Hood, TX	31.122419	-97.431052	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
480271045	Temple Georgia	8406 Georgia Avenue, Temple	Killeen-Temple-Fort Hood, TX	31.122419	-97.431052	Suburban	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
480271045	Temple Georgia	8406 Georgia Avenue, Temple	Killeen-Temple-Fort Hood, TX	31.122419	-97.431052	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
482570020	Terrell Temtex	2988 Temtex Blvd, Terrell	Dallas-Fort Worth-Arlington, TX	32.731919	-96.317911	Rural	TSP (Pb)	QA Collocated/SLAMS	HiVol ICP-MS	24 Hours; 1/12 Days	Population Exposure; Source Oriented	Neighborhood
482570020	Terrell Temtex	2988 Temtex Blvd, Terrell	Dallas-Fort Worth-Arlington, TX	32.731919	-96.317911	Rural	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood
480371031	Texarkana New Boston	2700 New Boston Rd, Texarkana	Texarkana, TX-Texarkana, AR	33.436111	-94.077780	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Urban Scale
480371031	Texarkana New Boston	2700 New Boston Rd, Texarkana	Texarkana, TX-Texarkana, AR	33.436111	-94.077780	Urban and Center City	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure	Urban Scale

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
480371031	Texarkana New Boston	2700 New Boston Rd, Texarkana	Texarkana, TX-Texarkana, AR	33.436111	-94.077780	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
480371031	Texarkana New Boston	2700 New Boston Rd, Texarkana	Texarkana, TX-Texarkana, AR	33.436111	-94.077780	Urban and Center City	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Urban Scale
481670004	Texas City Fire Station	2516 Texas Avenue, Texas City	Houston-Sugar Land-Baytown, TX	29.384444	-94.930833	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Highest Concentration	Neighborhood
481670004	Texas City Fire Station	2516 Texas Avenue, Texas City	Houston-Sugar Land-Baytown, TX	29.384444	-94.930833	Urban and Center City	PM10 (FRM)	QA Collocated/SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Highest Concentration	Neighborhood
484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	Tyler, TX	32.344008	-95.415752	Rural	NO/NO2/NOx	SPM	Chemiluminescence	Continuous	General/Background	Urban Scale
484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	Tyler, TX	32.344008	-95.415752	Rural	O3	SLAMS	UV Photometric	Continuous	General/Background	Urban Scale
484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	Tyler, TX	32.344008	-95.415752	Rural	Precipitation	SPM	Rain Gauge	Continuous	General/Background	Neighborhood
484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	Tyler, TX	32.344008	-95.415752	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	General/Background	Neighborhood
484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	Tyler, TX	32.344008	-95.415752	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	General/Background	Neighborhood
484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	Tyler, TX	32.344008	-95.415752	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General/Background	Neighborhood
481410693	Van Buren	2700 Harrison Avenue, El Paso	El Paso, TX	31.813370	-106.464520	Urban and Center City	PM10 (FRM)	SPM	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
481410693	Van Buren	2700 Harrison Avenue, El Paso	El Paso, TX	31.813370	-106.464520	Urban and Center City	Relative Humidity	SPM	Humidity Sensor	Continuous	Population Exposure	
481410693	Van Buren	2700 Harrison Avenue, El Paso	El Paso, TX	31.813370	-106.464520	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Population Exposure	
481410693	Van Buren	2700 Harrison Avenue, El Paso	El Paso, TX	31.813370	-106.464520	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	
484690003	Victoria	106 Mockingbird Lane, Victoria	Victoria, TX	28.836170	-97.005530	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood

Appendix A: Ambient Air Monitoring Network Site List

AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
484690003	Victoria	106 Mockingbird Lane, Victoria	Victoria, TX	28.836170	-97.005530	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood
484690003	Victoria	106 Mockingbird Lane, Victoria	Victoria, TX	28.836170	-97.005530	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
484690003	Victoria	106 Mockingbird Lane, Victoria	Victoria, TX	28.836170	-97.005530	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	CO	SLAMS	Gas Filter Correlation	Continuous	Upwind Background	Urban Scale
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Upwind Background	Urban Scale
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	O3	SLAMS	UV Photometric	Continuous	Upwind Background	Regional Scale
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	PM2.5 (TEOM)**	SPM	TEOM Gravimetric	Continuous	Population Exposure; Regional Transport	Regional Scale
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Upwind Background	Urban Scale
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Regional Transport	Urban Scale
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Regional Transport	Urban Scale
483091037	Waco Mazanec	4472 Mazanec Rd, Waco	Waco, TX	31.653074	-97.070698	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Urban Scale
483611001	West Orange	2700 Austin Ave, West Orange	Beaumont-Port Arthur, TX	30.085263	-93.761341	Urban and Center City	NO/NO2/NOx	SLAMS	Chemiluminescence	Continuous	Population Exposure	Neighborhood
483611001	West Orange	2700 Austin Ave, West Orange	Beaumont-Port Arthur, TX	30.085263	-93.761341	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
483611001	West Orange	2700 Austin Ave, West Orange	Beaumont-Port Arthur, TX	30.085263	-93.761341	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Source Oriented	Neighborhood
483611001	West Orange	2700 Austin Ave, West Orange	Beaumont-Port Arthur, TX	30.085263	-93.761341	Urban and Center City	Temperature (Outdoor)	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood

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AQS Site ID	Site Name	Address/Location	MSA / CBSA	Latitude	Longitude	Location Setting	Sampler Type	AQS Network & Monitor Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
483611001	West Orange	2700 Austin Ave, West Orange	Beaumont-Port Arthur, TX	30.085263	-93.761341	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Neighborhood
484790313	World Trade Bridge	Mines Road 11601 FM 1472, Laredo	Laredo, TX	27.599444	-99.533333	Suburban	PM2.5 (TEOM)**	Border Grant/SLAMS	TEOM Gravimetric	Continuous	Source Oriented	Microscale

Appendix A: Ambient Air Monitoring Network Site List

Table 1: Legend

Symbol/Acronym	Description
*	Granbury, Texas, is not a Metropolitan Statistical Area on the US Census Bureaus's list, but is designated as such in AQS
**	Regulations §58.30
@	at
24-Hour Avg, 1/6 Days	1 24-Hour Average, Once every Sixth Day
24-Hour; 1/3 Days	1 24-Hour Sample, Once every Third Day
24-Hours, Daily	1 24-Hour Sample, Daily
24 1-Hour Avg; Daily	24 1-Hour Average, Daily
8 3-Hours; 1/3 Days (Jul. - Sept.)	8 3-Hour Samples, Once every Third Day from July through September
8 3-Hours; 1/3 Days (Jun. - Aug.)	8 3-Hour Samples, Once every Third Day from June through August
AMNP	Annual Monitoring Network Plan
AQS	Air Quality System
AutoGC	automated gas chromatograph
Ave	Avenue
Blvd	Boulevard
Border	The Border network designation is part of the SLAMS network for monitors within 100 kilometers of the United States/Mexico border.
CO	carbon monoxide
Co	County
Dr	Drive
E	East
Elem	Elementary
FM	Farm-to-Market
FRM	federal reference method
Hwy	Highway
IH	Interstate Highway
Max	Maximum
N	North
NATTS	National Air Toxics Trends Stations
NCore	National Core Multipollutant Monitoring Stations
NE	Northeast
$NO/NO_2/NO_x$	nitrogen oxides
NO_y	total reactive nitrogen
O_3	ozone
PAMS	Photochemical Assessment Monitoring Stations
PM_{10}	particulate matter of 10 micrometers or less in diameter

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Symbol/Acronym	Description
$PM_{10-2.5}$	coarse particulate matter
$PM_{2.5}$	particulate matter of 2.5 micrometers or less in diameter
QA Collocated	quality assurance collocated monitor
Rd	Road
S	South
SB	South Bound
SETRPC	Southeast Texas Regional Planning Commission
SLAMS	State or Local Air Monitoring Stations
SO_2	sulfur dioxide (one-hour and five-minute maximum monitors)
SPM	special purpose monitor
St	Street
SVOC	semi-volatile organic compound
TCEQ	Texas Commission on Environmental Quality
TEOM	tapered element oscillating microbalance
TSP	total suspended particulate
TSP (Pb)	total suspended particulate (lead)
UV	ultraviolet
VOC	volatile organic compound
Wind	All wind sampler types produce data for parameters 61101, 61103, 61104, 61105, and 61106.
W	West
Yd	Yard

Appendix B

Population and Monitoring Requirements by Metropolitan Statistical Area

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix B: Population and Monitoring Requirements by Metropolitan Statistical Area

Texas Metropolitan Statistical Areas	Population*	$NO/NO_2/NO_x/NO_y$		SO_2		Pb		O_3		CO		PM_{10}		$PM_{2.5}$	
		Required	Current†	Required	Current†	Required	Current†	Required	Current†	Required	Current†	Required	Current†	Required	Current†
Dallas-Fort Worth-Arlington	7,233,323	7	15	2	4	2	5	5	19	2	2	4 - 8	4	7	14
Houston-The Woodlands-Sugar Land	6,772,470	7	19	3	8	0	0	5	20	2	3	4 - 8	6	11	18
San Antonio-New Braunfels	2,429,609	2	3	2	2	0	0	2	3	1	1	2 - 4	2	5	8
Austin-Round Rock	2,056,405	2	2	1	1	0	0	2	2	1	1	2 - 4	2	3	6
McAllen-Edinburg-Mission	849,843	0	0	0	0	0	0	1	1	0	0	1 - 2	2	3	3
El Paso	841,971	3	4	1	3	0	2	3	6	1	3	2 - 4	5	6	7
Corpus Christi	454,726	0	0	0	3	0	0	2	2	0	0	0 - 1	1	2	4
Killeen-Temple	435,857	0	0	0	0	0	0	2	2	0	0	0 - 1	0	0	0
Brownsville-Harlingen	422,135	0	0	0	0	0	1	1	2	0	1	0 - 1	0	1	3
Beaumont-Port Arthur	409,968	1	4	3	4	0	0	2	7	0	1	0 - 1	0	0	3
Lubbock	314,840	0	0	0	0	0	0	0	0	0	0	0 - 1	0	0	1
Laredo	271,193	0	0	0	0	0	1	0	1	0	2	0 - 1	2	1	1
Waco	265,207	0	1	0	1	0	0	1	1	0	1	0 - 1	0	0	1
Amarillo	263,342	0	0	1	2	1	1	0	0	0	0	0 - 1	0	0	1
College Station-Bryan	254,928	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Tyler	225,290	0	1	0	0	0	0	1	1	0	0	0	1	0	0
Longview	217,446	0	1	1	1	0	0	1	1	0	0	0	0	0	0
Abilene	170,364	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Midland	168,288	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odessa	157,462	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wichita Falls	150,734	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Texarkana	150,098	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Sherman-Denison	128,235	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Angelo	119,943	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Victoria	99,984	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Marshall[1]	66,534	0	1	1	1	0	0	0	1	0	0	0	1	1	3
Eagle Pass[1]	57,685	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Corsicana[1]	48,523	0	0	1	1	0	0	0	0	0	0	0	0	0	1
Big Bend National Park[2]	not available	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Big Spring[1]	38,022	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Borger[1]	21,511	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Mount Pleasant[1]	32,592	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Milam County[2]	24,871	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Total		**22**	**51**	**21**	**36**	**3**	**10**	**29**	**70**	**7**	**15**	**15-38**	**26**	**42**	**79**

†Monitors may fulfill multiple monitoring requirements, but are only counted once. Quality assurance monitors are not counted.

*United States Census Bureau population estimates as of July 1, 2016

[1]Area is classified as a micropolitan statistical area and not subject to SLAMS requirements

[2]Area does not fall within a metropolitan or micropolitan statistical area. No population data is available for Big Bend National Park.

Only primary monitors included in Appendix A are included in this table.

Required and current monitor counts include NOy, high sensitivity SO_2, and high sensitivity CO.

$PM^{10-2.5}$ NCore requirements are not included in particulate matter counts.

Planned deployment of required monitors is discussed in the applicable section of the AMNP document.

$NO/NO_2/NO_x/NO_y$ - oxides of nitrogen and total reactive nitrogen compounds

CO - carbon monoxide

SO_2 - sulfur dioxide

Pb - lead

O_3 - ozone

PM_{10} - particulate matter of 10 micrometers or less

$PM_{2.5}$ - particulate matter of 2.5 micrometers or less

VOC - volatile organic compound

Appendix C

Nitrogen Dioxide and Total Reactive Nitrogen Monitoring Requirements

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix C: Nitrogen Dioxide and Total Reactive Nitrogen Monitoring Requirements

Core Based Statistical Areas	2016 Population Estimates[1]	Required NO_2 Area-Wide Monitors	Required NO_2 RA-40 Monitors	Required NO_2 Near-Road Monitors	Required NO_2 PAMS Monitors	Required High Sensitivity NO_y NCore Monitors	Required High Sensitivity NO_y PAMS Monitors	Total Required NO_2 and NO_y Monitors[3]	Total Current NO_2 and NO_y Monitors[2]
Dallas-Fort Worth-Arlington	7,233,323	Dallas Hinton	Arlington Municipal Airport	Dallas LBJ Freeway and Fort Worth California Parkway	Dallas Hinton	Dallas Hinton	Dallas Hinton	7	15
Houston-The Woodlands-Sugar Land	6,772,470	Clinton	Clinton	Houston Southwest Freeway and Houston North Loop	Houston Deer Park #2	Houston Deer Park #2	Houston Deer Park #2	7	19
San Antonio-New Braunfels	2,429,609	San Antonio Northwest	None	San Antonio Interstate 35	None	None	None	2	3
Austin-Round Rock	2,056,405	Austin Northwest	None	Austin North Interstate 35	None	None	None	2	2
McAllen-Edinburg-Mission	849,843	None	None	None	None	None	None	0	0
El Paso	841,971	None	Ascarate Park SE	None	El Paso Chamizal	El Paso Chamizal	None	3	4
Corpus Christi	454,726	None	None	None	None	None	None	0	0
Killeen-Temple	435,857	None	None	None	None	None	None	0	0
Brownsville-Harlingen	422,135	None	None	None	None	None	None	0	0
Beaumont-Port Arthur	409,968	None	Nederland High School	None	None	None	None	1	4
Lubbock	314,840	None	None	None	None	None	None	0	0
Laredo	271,193	None	None	None	None	None	None	0	0
Waco	265,207	None	None	None	None	None	None	0	1
Amarillo	263,342	None	None	None	None	None	None	0	0
College Station-Bryan	254,928	None	None	None	None	None	None	0	0
Tyler	225,290	None	None	None	None	None	None	0	1
Longview	217,446	None	None	None	None	None	None	0	1
Abilene	170,364	None	None	None	None	None	None	0	0
Midland	168,288	None	None	None	None	None	None	0	0
Odessa	157,462	None	None	None	None	None	None	0	0
Wichita Falls	150,734	None	None	None	None	None	None	0	0
Texarkana	150,098	None	None	None	None	None	None	0	0
Sherman-Denison	128,235	None	None	None	None	None	None	0	0
San Angelo	119,943	None	None	None	None	None	None	0	0
Victoria	99,984	None	None	None	None	None	None	0	0
Marshall*	66,534	None	None	None	None	None	None	0	1
Total		**4**	**4**	**6**	**3**	**3**	**2**	**22**	**51**

[1]United States Census Bureau population estimates as of July 1, 2016

[2]Monitors may fulfill multiple monitoring requirements but are only counted once

[3]Total required monitors is a count of individual requirements for area-wide, RA-40, near-road, PAMS, and high sensitivity monitors. Deployed monitors can fulfill multiple monitoring requirements.

*Area is classified as a micropolitan statistical area and not subject to SLAMS requirements

PAMS - Photochemical Assessment Monitoring Stations

NCore - National Core Multipollutant Monitoring Stations

RA-40 - Regional Administrator 40

NO_2 - nitrogen dioxide

NO_Y - total reactive nitrogen compounds

Appendix D

Sulfur Dioxide Monitoring Information

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix D: Sulfur Dioxide Monitoring Information

Table 1: Sulfur Dioxide PWEI Monitoring Requirements

Core Based Statistical Area	County	2016 Population Estimates*	2014 Point Source (tpy)	2014 NEI Data (tpy)	2015 Point Source (tpy)	2014 NEI Non-Point Source Data with 2015 Point Source Data (tpy)	PWEI	Required PWEI SO_2 Monitors	Required SO_2 DRR Monitors in CBSAs	Required High Sensitivity SO_2 NCore Monitors	Total Required SO_2 Monitors	Existing Monitors**
Amarillo		**263,342**				**15,414.17**	**4,059**	**0**	**1**	**0**	**1**	**2**
	Armstrong	1,876	0.32	1.25	0.05	0.98						
	Carson	6,057	0.23	18.19	0.16	18.12						
	Potter	120,832	15,474.50	15,554.89	15,187.40	15,267.79						
	Randall	132,501	118.52	137.36	100.30	119.14						
	Oldham	2,076	N/A	8.14	N/A	8.14						
Austin-Round Rock		**2,056,405**				**2,711.02**	**5,575**	**1**	**0**	**0**	**1**	**1**
	Bastrop	82,733	288.17	305.17	296.48	313.48						
	Caldwell	41,161	330.80	363.63	322.52	355.35						
	Hays	204,470	1,330.51	1,365.29	1,103.60	1,138.38						
	Travis	1,199,323	62.94	837.06	62.65	836.77						
	Williamson	528,718	0.40	63.94	3.49	67.03						
Beaumont-Port Arthur		**409,968**				**17,697.78**	**7,256**	**1**	**2**	**0**	**3**	**4**
	Hardin	56,322	1.22	17.20	1.00	16.98						
	Jefferson	254,679	13,291.56	13,619.47	12,054.59	12,382.50						
	Orange	84,964	6,188.20	6,242.40	5,225.21	5,279.41						
	Newton	14,003	11.46	14.96	15.39	18.89						
Dallas-Fort Worth-Arlington		**7,233,323**				**4,867.79**	**35,210**	**1**	**0**	**1**	**2**	**4**
	Collin	939,585	23.58	173.72	21.24	171.38						
	Dallas	2,574,984	315.64	1,096.99	321.70	1,103.05						
	Denton	806,180	453.44	547.41	503.90	597.87						
	Ellis	168,499	4,008.64	4,082.03	2,193.63	2,267.02						
	Hunt	92,073	0.16	63.40	0.19	63.43						
	Kaufman	118,350	73.86	130.60	63.01	119.75						
	Rockwall	93,978	0.01	11.14	0.03	11.16						
	Johnson	163,274	88.39	137.40	84.45	133.46						
	Parker	129,441	154.39	185.49	181.21	212.31						
	Tarrant	2,016,872	22.98	41.65	25.71	44.39						
	Wise	64,455	16.06	34.36	109.41	127.71						
	Hood	56,857	11.96	19.17	9.05	16.26						
	Somervell	8,775	0.00	3.74	N/A	N/A						
Houston-The Woodlands-Sugar Land		**6,772,470**				**56,158.32**	**380,331**	**2**	**0**	**1**	**3**	**8**
	Austin	29,758	83.76	136.20	74.43	126.88						
	Brazoria	354,195	557.59	705.79	554.39	702.59						
	Chambers	39,899	218.21	262.98	392.40	437.17						
	Fort Bend	741,237	43,988.84	44,087.89	42,700.08	42,799.13						
	Galveston	329,431	1,178.00	2,642.64	1,326.05	2,790.69						
	Harris	4,589,928	7,780.28	9,671.86	7,239.94	9,131.52						
	Liberty	81,704	12.84	38.73	15.91	41.80						
	Montgomery	556,203	10.97	103.94	13.45	106.42						
	Waller	50,115	1.46	23.27	0.31	22.12						

Appendix D: Sulfur Dioxide Monitoring Information

Core Based Statistical Area	County	2016 Population Estimates*	2014 Point Source (tpy)	2014 NEI Data (tpy)	2015 Point Source (tpy)	2014 NEI Non-Point Source Data with 2015 Point Source Data (tpy)	PWEI	Required PWEI SO_2 Monitors	Required SO_2 DRR Monitors in CBSAs	Required High Sensitivity SO_2 NCore Monitors	Total Required SO_2 Monitors	Existing Monitors**
Longview		**217,446**				**23,538.64**	**5,118**	**1**	**0**	**0**	**1**	**1**
	Gregg	123,745	39.87	286.15	21.42	267.71						
	Rusk	52,732	53,903.48	53,952.25	23,175.02	23,223.79						
	Upshur	40,969	30.19	41.12	36.22	47.15						
San Antonio-New Braunfels		**2,429,609**				**19,701.25**	**47,866**	**1**	**1**	**0**	**2**	**2**
	Atascosa	48,797	6,944.87	8,558.17	5,596.43	7,209.73						
	Bandera	21,776	0.12	3.70	0.18	3.76						
	Bexar	1,928,680	17,827.56	18,230.22	10,947.55	11,350.21						
	Comal	134,788	377.02	408.90	420.01	451.89						
	Guadalupe	155,265	112.34	161.63	109.94	159.23						
	Kendall	42,540	0.04	10.08	0.01	10.05						
	Medina	49,283	0.00	11.84	N/A	N/A						
	Wilson	48,480	663.82	858.83	321.38	516.39						
Abilene		**170,364**				**48.17**	**8**	**0**	**0**	**0**	**0**	**0**
	Callahan	13,820	0.00	3.36	N/A	N/A						
	Jones	20,009	0.00	6.52	0.00	6.52						
	Taylor	136,535	0.02	41.65	0.02	41.65						
Brownsville-Harlingen		**422,135**				**86.21**	**36**	**0**	**0**	**0**	**0**	**0**
	Cameron	422,135	0.25	86.21	0.25	86.21						
College Station-Bryan		**254,928**				**9,237.00**	**2,355**	**0**	**1**	**0**	**1**	**1**
	Brazos	220,417	12.62	98.88	11.59	97.85						
	Burleson	17,760	0.00	19.65	N/A	N/A						
	Robertson	16,751	13,166.20	13,208.73	9,096.62	9,139.15						
Corpus Christi		**454,726**				**967.52**	**440**	**0**	**0**	**0**	**0**	**3**
	Aransas	25,721	0.00	75.69	0.00	75.69						
	Nueces	361,350	790.35	881.53	694.49	785.67						
	San Patricio	67,655	29.18	107.48	27.86	106.16						
El Paso		**841,971**				**445.37**	**375**	**0**	**0**	**1**	**1**	**3**
	El Paso	837,918	262.73	405.31	295.14	437.72						
	Hudspeth	4,053	7.28	8.91	6.02	7.65						
McAllen-Edinburg-Mission		**849,843**				**176.65**	**150**	**0**	**0**	**0**	**0**	**0**
	Hidalgo	849,843	50.30	169.16	57.79	176.65						
Midland		**168,288**				**2,872.73**	**483**	**0**	**0**	**0**	**0**	**0**
	Midland	162,565	415.03	1,304.59	110.56	1,000.12						
	Martin	5,723	43.23	1,898.86	16.97	1,872.60						
Waco		**265,207**				**1,910.11**	**507**	**0**	**0**	**0**	**0**	**1**
	McLennan	247,934	3,196.71	3,320.10	1,786.72	1,910.11						
	Falls	17,273	0.00	11.43	N/A	N/A						

Appendix D: Sulfur Dioxide Monitoring Information

Core Based Statistical Area	County	2016 Population Estimates*	2014 Point Source (tpy)	2014 NEI Data (tpy)	2015 Point Source (tpy)	2014 NEI Non-Point Source Data with 2015 Point Source Data (tpy)	PWEI	Required PWEI SO_2 Monitors	Required SO_2 DRR Monitors in CBSAs	Required High Sensitivity SO_2 NCore Monitors	Total Required SO_2 Monitors	Existing Monitors**
Big Spring[1]		**38,022**				**3,510.69**	**133**	**0**	**1**	**0**	**1**	**1**
	Glassock	1,314										
	Howard	36,708	7,219.21	7,523.95	7,593.99	7,898.73						
Marshall[1]		**66,534**				**3,510.69**	**234**	**0**	**1**	**0**	**1**	**1**
	Harrison	66,534	3,555.97	3,625.92	3,440.74	3,510.69						
Corsicana[1]		**48,523**				**3,787.05**	**184**	**0**	**1**	**0**	**1**	**1**
	Navarro	48,523	3,628.73	3,667.92	3,747.86	3,787.05						
Mount Pleasant[1]		**32,592**				**32,684.48**	**1,065**	**0**	**1**	**0**	**1**	**1**
	Titus	32,592	38,740.15	38,776.12	32,648.51	32,684.48						
Borger[1]		**21,511**				**9,162.95**	**197**	**0**	**1**	**0**	**1**	**1**
	Hutchinson	21,511	10,645.70	10,664.05	9,144.60	9,162.95						
N/A		**24,871**				**22,733.35**	**565**	**0**	**1**	**0**	**1**	**1**
	Milam	24,871	24,202.56	24,215.79	22,720.12	22,733.35						
Total Monitors								**7**	**11**	**3**	**21**	**36**

*United States Census Bureau population estimates as of July 1, 2016

** Individual monitors may fulfill more than one monitoring requirement but are only counted once.

[1]Micropolitan statistical area

DRR - Data Requirements Rule

NCore - National Core Multipollutant Monitoring Stations

N/A - not applicable

NEI - National Emissions Inventory

PWEI - population weighted emission index (Population *[2014 NEI non-point source data and 2015 point source data]/1,000,000)

SO_2 - sulfur dioxide

tpy - tons per year

Appendix D: Sulfur Dioxide Monitoring Information

Table 2: Sulfur Dioxide Emissions Inventory Evaluation

Regulated Entity Number (RN)	Facility Name	County	2015 SO_2 Emissions (tons per year)	Characterization Method
RN100217975	Calaveras Plant	Bexar	10,181	Monitoring
RN100888312	WA Parish Electric Generating Station	Fort Bend	42,690	Modeling
RN101198059	Big Brown Steam Electric Station	Freestone	49,837	Modeling
RN100214287	AEP Pirkey Power Plant	Harrison	2,957	Monitoring
RN100226026	Big Spring Carbon Black	Howard	6,307	Monitoring
RN100542927	Limestone Electric Generation Station	Limestone	17,218	Modeling
RN100224534	Tolk Station	Lamb	16,080	Modeling
RN100222413	Borger Carbon Black Plant (Sid Richardson)	Hutchinson	4,968	Monitoring
RN100209659	Borger Carbon Black Plant (Orion)	Hutchinson	3,105	Monitoring
RN100209287	Oxbow Calcining	Jefferson	9,968	Monitoring
RN102147881	Sandow Steam Electric Station	Milam	20,929	Monitoring
RN100226919	Coleto Creek Power Station	Goliad	8,261	Modeling
RN105369805	Sandow 5 Generating Plant	Milam	1,791	Monitoring
RN100226539	San Miguel Electric Plant	Atascosa	5,521	Modeling
RN100211283	Streetman Plant	Navarro	3,475	Monitoring
RN100209386	Echo Carbon Black Plant	Orange	3,240	Monitoring
RN100226570	Twin Oaks	Robertson	4,494	Modeling
RN100224849	Harrington Station Power Plant	Potter	15,107	Monitoring
RN100216191	Oak Grove Steam Electric Station	Robertson	4,603	Monitoring
RN102583093	Martin Lake Electrical Station	Rusk	22,930	Modeling
RN102285921	Monticello Steam Electric Station	Titus	18,399	Modeling
RN100213370	Welsh Power Plant	Titus	14,249	Monitoring
RN104136700	Sandy Creek Energy Station	McLennan	1,602	Modeling
RN101062255	Oklaunion Power Station	Wilbarger	1,480	Modeling
RN102579307	Baytown Refinery	Harris	1,452	Exempt

SO_2 - sulfur dioxide

Appendix D: Sulfur Dioxide Monitoring Information

Sulfur Dioxide Monitor Locations Recommended for Decommission

This section provides a visual model of the SO_2 monitoring network in the El Paso, Houston, and Dallas regions, where monitors are proposed for decommission. The maps below show the locations of existing SO_2 monitors relative to the location of the monitors recommended for decommission. A list of the SO_2 monitoring stations recommended for decommission is in the narrative of this network plan, along with design value trends and supporting information.

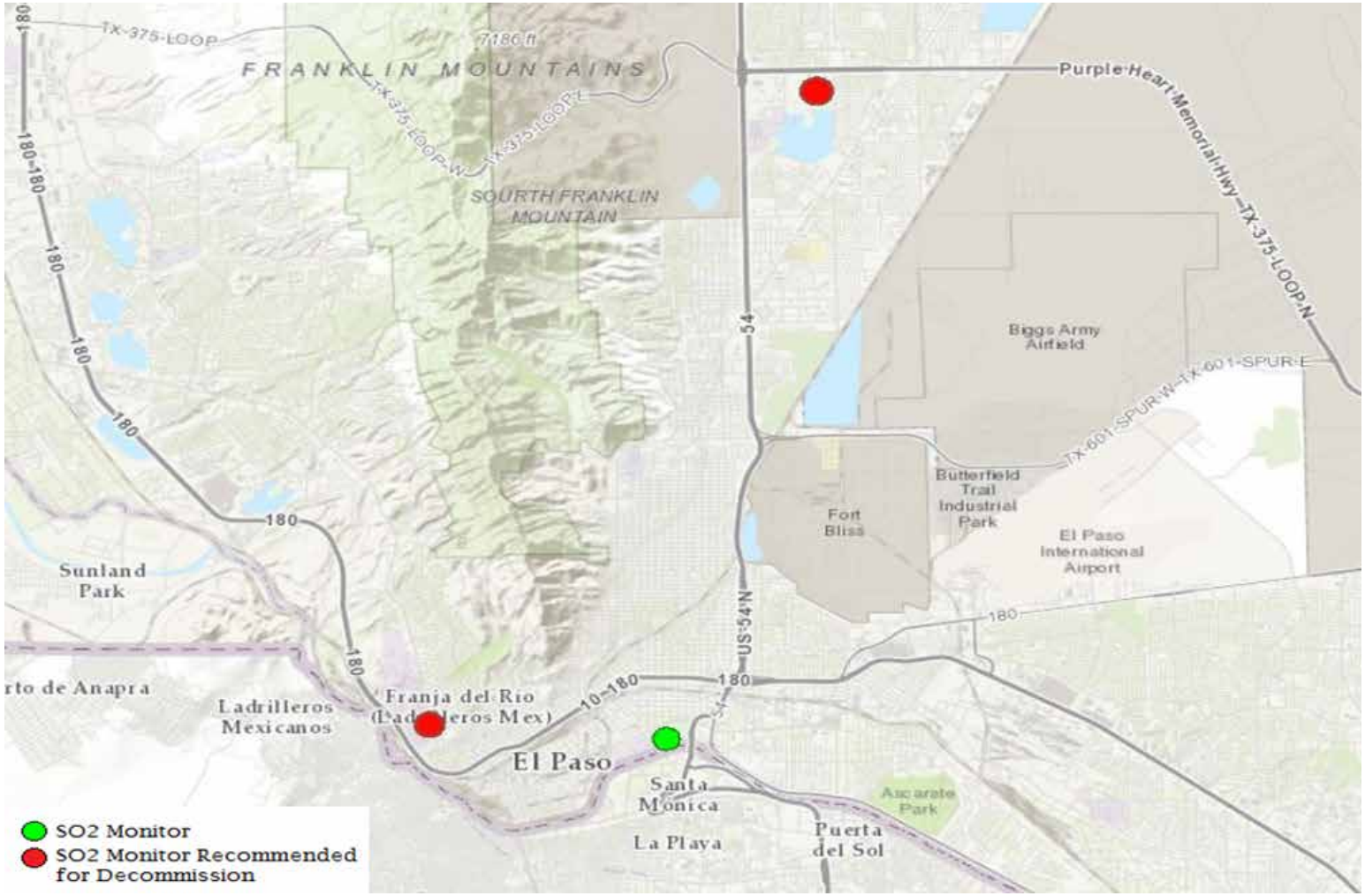

Figure 1: SO_2 Monitors in El Paso, Texas

Appendix D: Sulfur Dioxide Monitoring Information

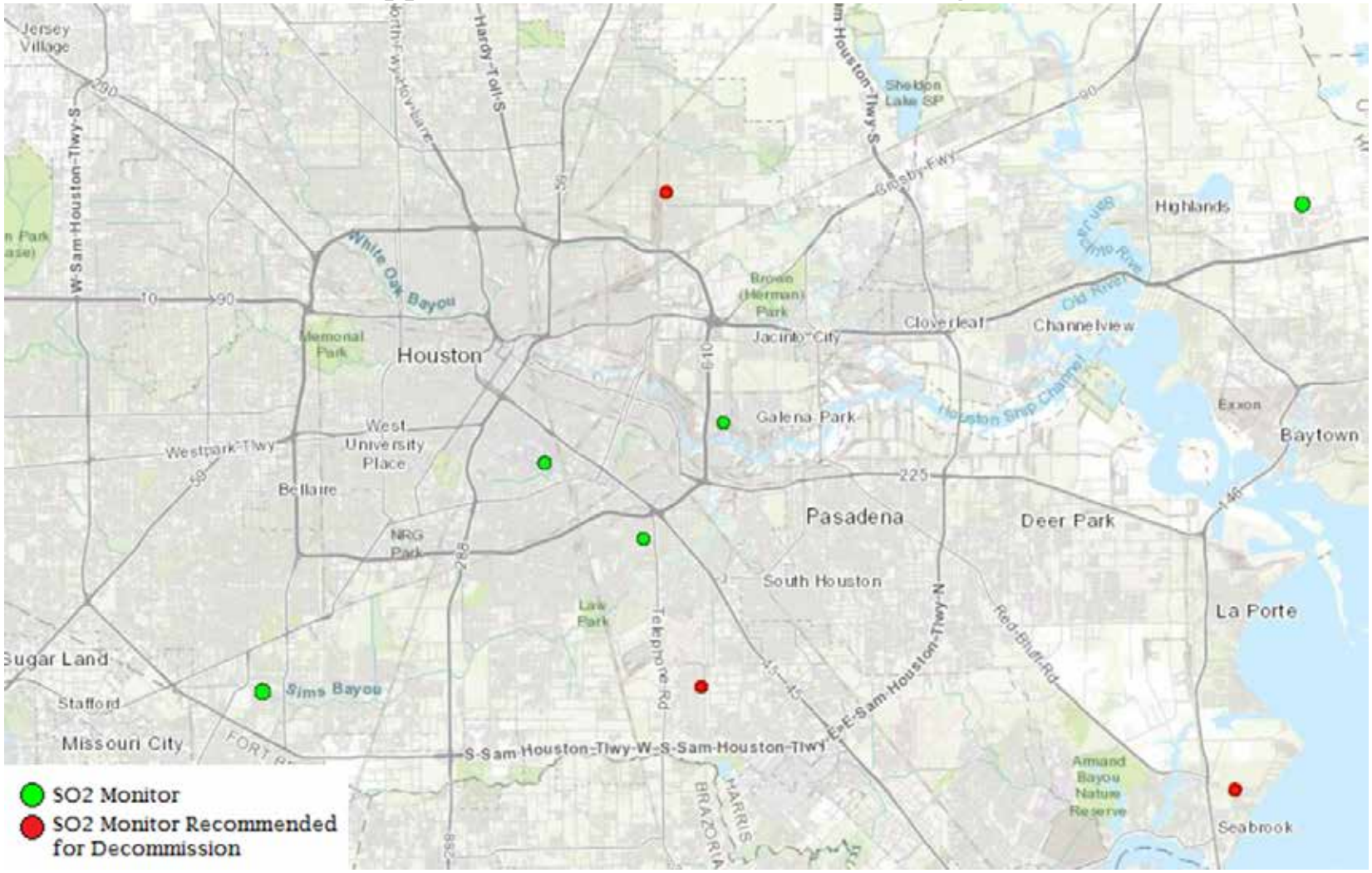

Figure 2: SO_2 Monitors in Houston, Texas

Appendix D: Sulfur Dioxide Monitoring Information

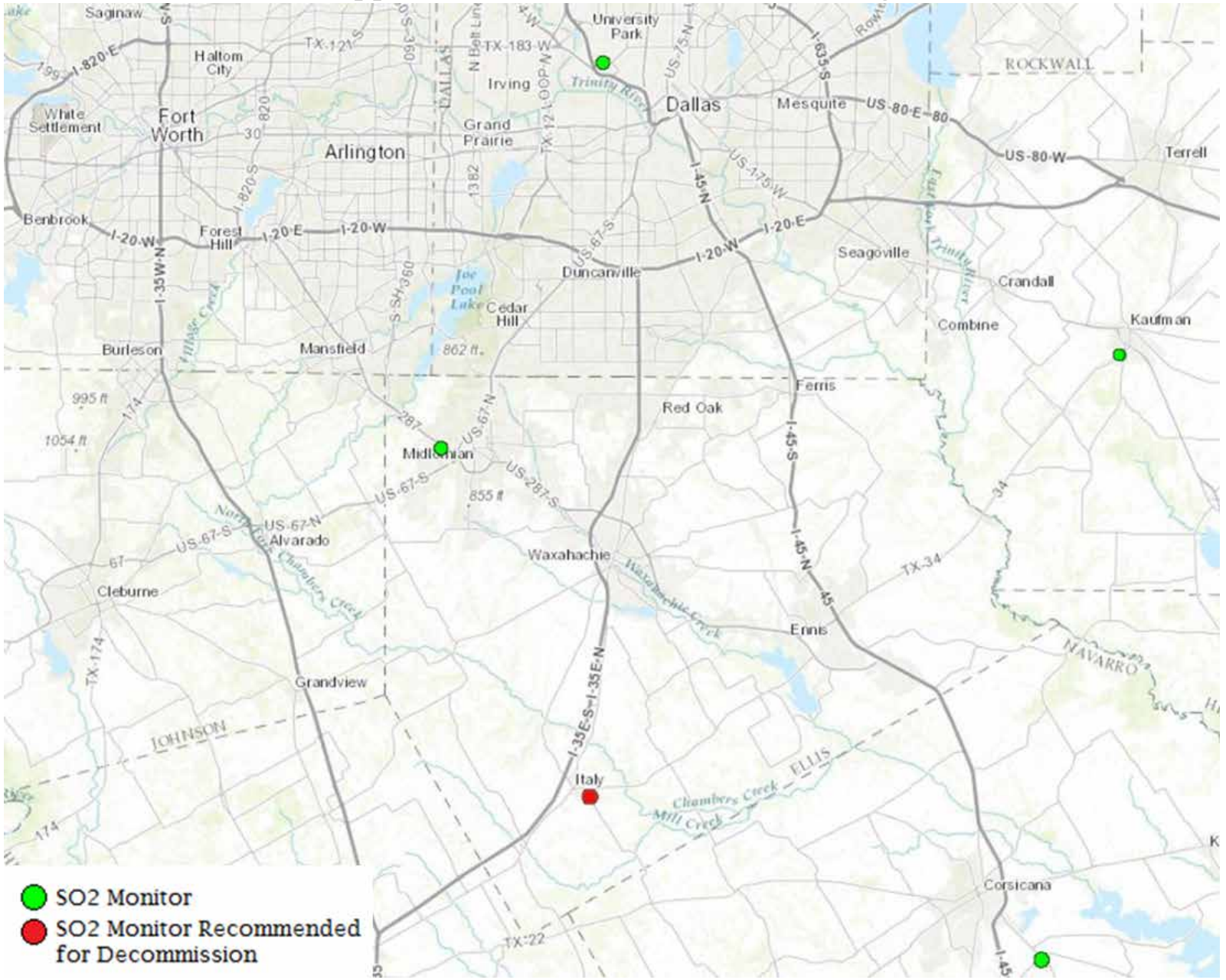

Figure 3: SO_2 Monitors in Dallas, Texas

Appendix E

Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Introduction

On August 21, 2015, the United States (U.S.) Environmental Protection Agency (EPA) finalized the sulfur dioxide (SO_2) Data Requirements Rule (DRR) for the 2010 one-hour SO_2 primary National Ambient Air Quality Standard (NAAQS). The DRR requires air agencies to characterize current air quality in areas around sources that emit 2,000 tons per year (tpy) or more of SO_2 and that are not located in an area already designated nonattainment. The DRR gives air agencies the option to characterize air quality using either modeling of actual source emissions or using appropriately sited ambient air quality monitors. Air agencies are required to locate the source-oriented SO_2 monitors in locations of expected maximum one-hour concentrations.

The EPA designated areas surrounding three sources, Big Brown Steam Electric Station, Martin Lake Electrical Station, and Monticello Steam Electric Station nonattainment for SO_2, effective January 12, 2017. The TCEQ intends to deploy monitoring stations to characterize SO_2 concentrations near these sources. A request for reconsideration of all three designations was submitted to the EPA in February 2017.

The TCEQ collectively considered several parameters to determine viable sites for source-oriented SO_2 monitors: predominant wind flow, modeling analyses, property owner agreement, and logistical constraints, such as space, power availability, terrain, grade, and drainage.

This appendix includes information, specific to each source, used in determining locations for source-oriented SO_2 monitors.

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Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Big Brown Steam Electric Station

Source Information

- Name: Big Brown Steam Electric Station (Big Brown) (Figure 2)
- Owner: Luminant Generation Company, LLC
- Facility function: electric generation
- Location: 31.81989, -96.05457, TCEQ Region 9, Freestone County, Texas
- SO_2 emissions data: 62,494 tons (2013), 57,460 tons (2014), 49,837 tons (2015)
- Long-term emissions trend: decreasing, 20 percent (%) decrease from 2013 to 2015
- Emission profile: operational year-round
- Stack height(s): two stacks, S-1 and S-2, each 122 meters (m) high, currently active
- SO_2 emission controls: miscellaneous fabric filters and electrostatic precipitators
- Permit related data: Federal Operating Permit number 065

Existing Air Monitoring Sites

The TCEQ operates three ambient air monitoring sites within a 100 kilometer (km) radius of Big Brown. Table 1 details these monitoring sites in order of proximity. While many factors affect where maximum SO_2 ground level concentrations would be expected to occur, generally they are expected to occur closer to the emission source. Although two of these locations are currently monitoring SO_2, none of the existing sites are within a reasonable proximity to the source to characterize expected maximum SO_2 ground level concentrations.

Table 1: Air Monitoring Sites Near Big Brown

Site	Distance from Big Brown	Current Sulfur Dioxide (SO_2) Monitoring	SO_2 Design Value (2013–2015)
Corsicana Airport	40 km northwest	Yes	39 parts per billion (ppb)
Tyler Airport Relocated	84 km southwest	No	Not applicable
Waco Mazanec	98 km northwest	Yes	7 ppb

km – kilometer

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Settings and Surroundings

The primarily rural area surrounding Big Brown is located in the northern portion of the Southern Post Oak Savanna ecoregion of the East Central Texas Plains. This area is characterized by a mix of post oak woods, improved pasture, and rangeland (Griffith et al. 2004). The elevation ranges from 91 m to 147 m as shown in Figure 1. The area is speckled with inactive oil and gas drilling pad sites with no access to electrical power. No significant changes to the landscape were noted during the reconnaissance as compared to the satellite image shown in Figure 6. Due to minimal geographical obstructions, wind patterns are highly consistent across the East Central Texas Plains area. Mountain and valley wind channeling, or other terrain related meteorological impacts, are not expected in the area surrounding Big Brown.

Figure 1: Big Brown Area Elevation Map

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

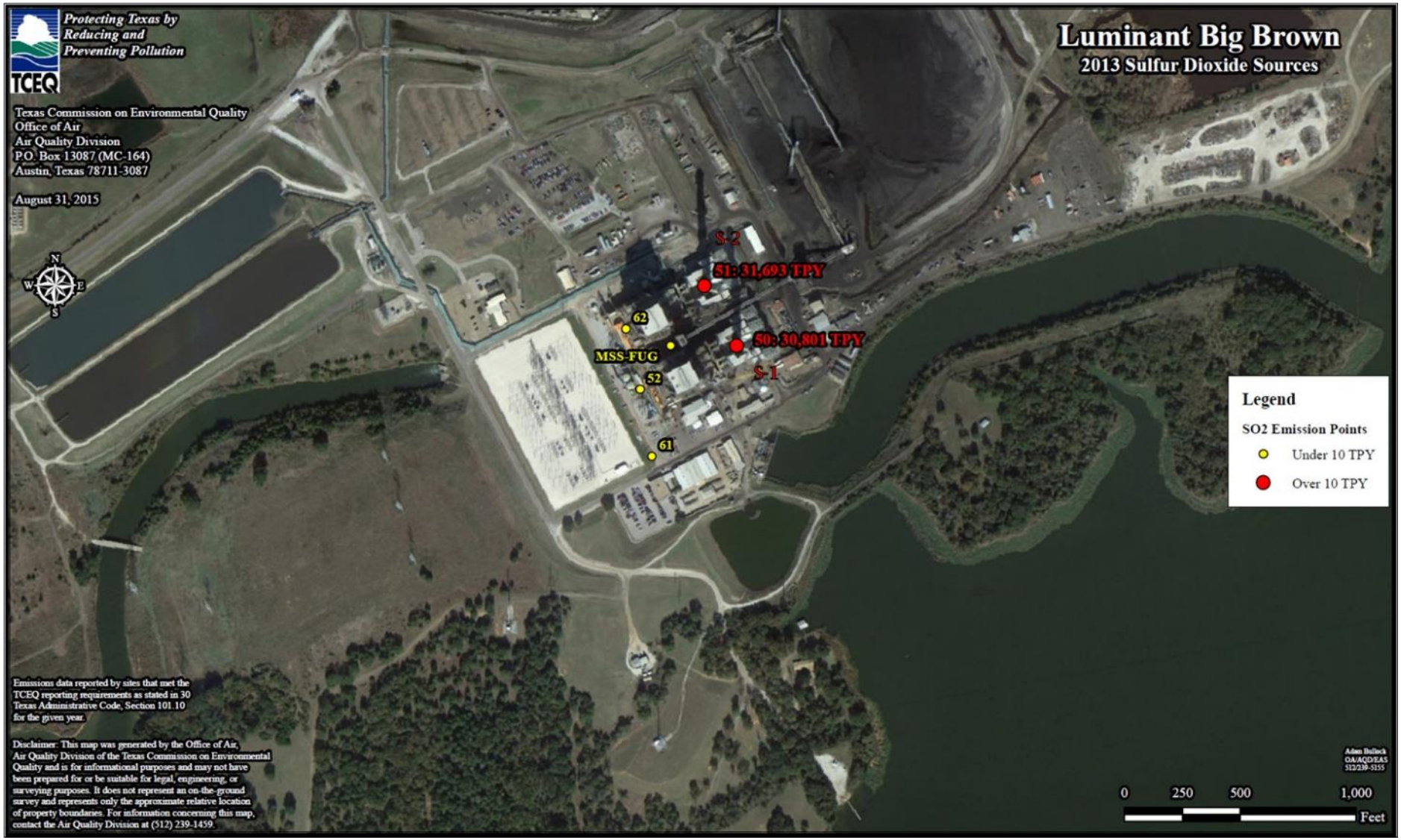

Figure 2: Big Brown Sulfur Dioxide (SO_2) Stacks and Emissions for 2013

TPY – tons per year

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Meteorological Data

Figure 3 provides illustrations of local area annual average wind speed and direction for 2012, 2013, and 2014 from meteorological sensors at the Corsicana Municipal Airport, located 40 km northwest of Big Brown. Figure 4 illustrates the 2012-2014 annual average wind speed. The length of each wind rose bar corresponds to the frequency of the wind coming from the indicated direction by percentage. Based on the analysis of the 2012-2014 wind data, the dominant wind flow direction for the area is 135 degrees southeast to 220 degrees south-southwest. Approximately 47% of the average area wind flows move from these directions. Over this three year period, calm winds [0-2 miles per hour (mph)] occurred on average 8% of the time, and wind speeds averaged 8.9 mph (Iowa Environmental Mesonet 2016).

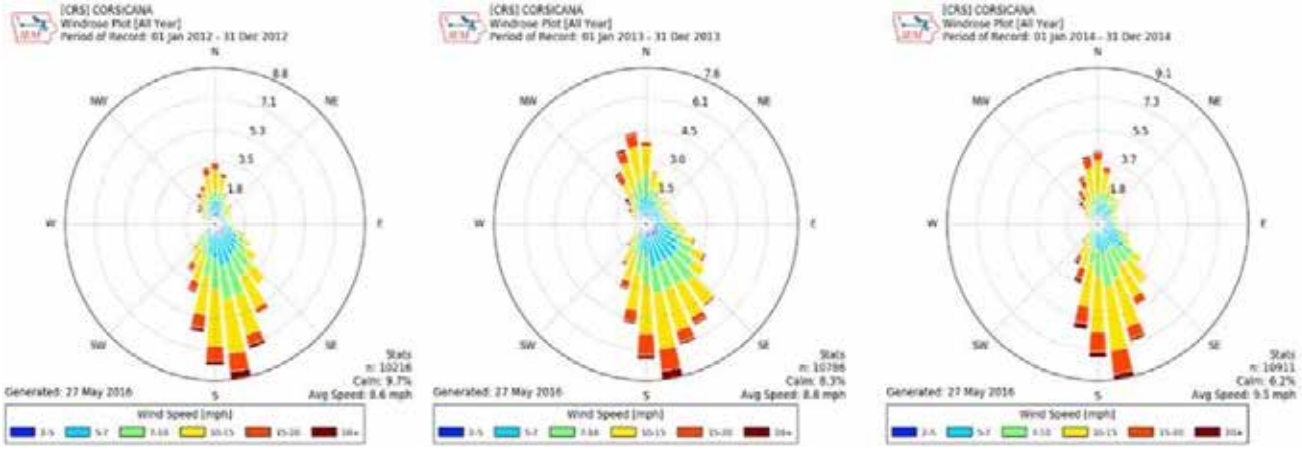

Figure 3: (From left to right) 2012, 2013, and 2014 Individual Wind Rose Plots

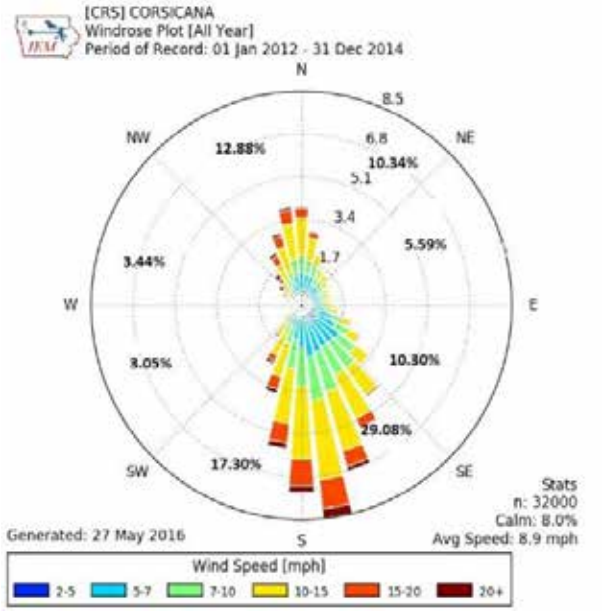

Figure 4: 2012–2014 Combined Average Wind Rose Plot

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Modeling Analysis for Monitoring Site Placement

The *SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document* (Monitoring TAD) suggests that modeling is one technique that may be used to assist in identifying potential monitoring sites. The *SO_2 NAAQS Designations Modeling Technical Assistance Document* (Modeling TAD) notes that for area designations under the 2010 SO_2 National Ambient Air Quality Standard (NAAQS), the AERMOD modeling system should be used unless use of an alternative model can be justified.

In developing area designations for the 2010 SO_2 NAAQS, the AERMOD modeling analysis provided by the Sierra Club in March 2016, was cited in the *Final Technical Support Document for the Designation Recommendations for the 2010 Sulfur Dioxide National Ambient Air Quality Standards (NAAQS) – Supplement for Four Areas in Texas Not Addressed in June 30, 2016, Version* (the United States [U.S.] Environmental Protection Agency [EPA] docket identification number, EPA-HQ-OAR-2014-0464-0434) as relevant information considered by the EPA in the Big Brown designation decision. Given the EPA's reliance on the 2016 Sierra Club modeling for designation purposes, the TCEQ has used this modeling as one tool to inform possible SO_2 monitor placement recommendations near Big Brown. The use of the 2016 Sierra Club modeling analysis for possible monitor placement decisions does not infer the TCEQ's concurrence with the use of this modeling analysis for any other purpose. Figure 5 illustrates the Sierra Club's predicted modeled impacts for the 2013-2015 actual facility emissions. In this figure, the TCEQ viable air monitoring sites are identified with green pins and non-viable sites are identified with red pins.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

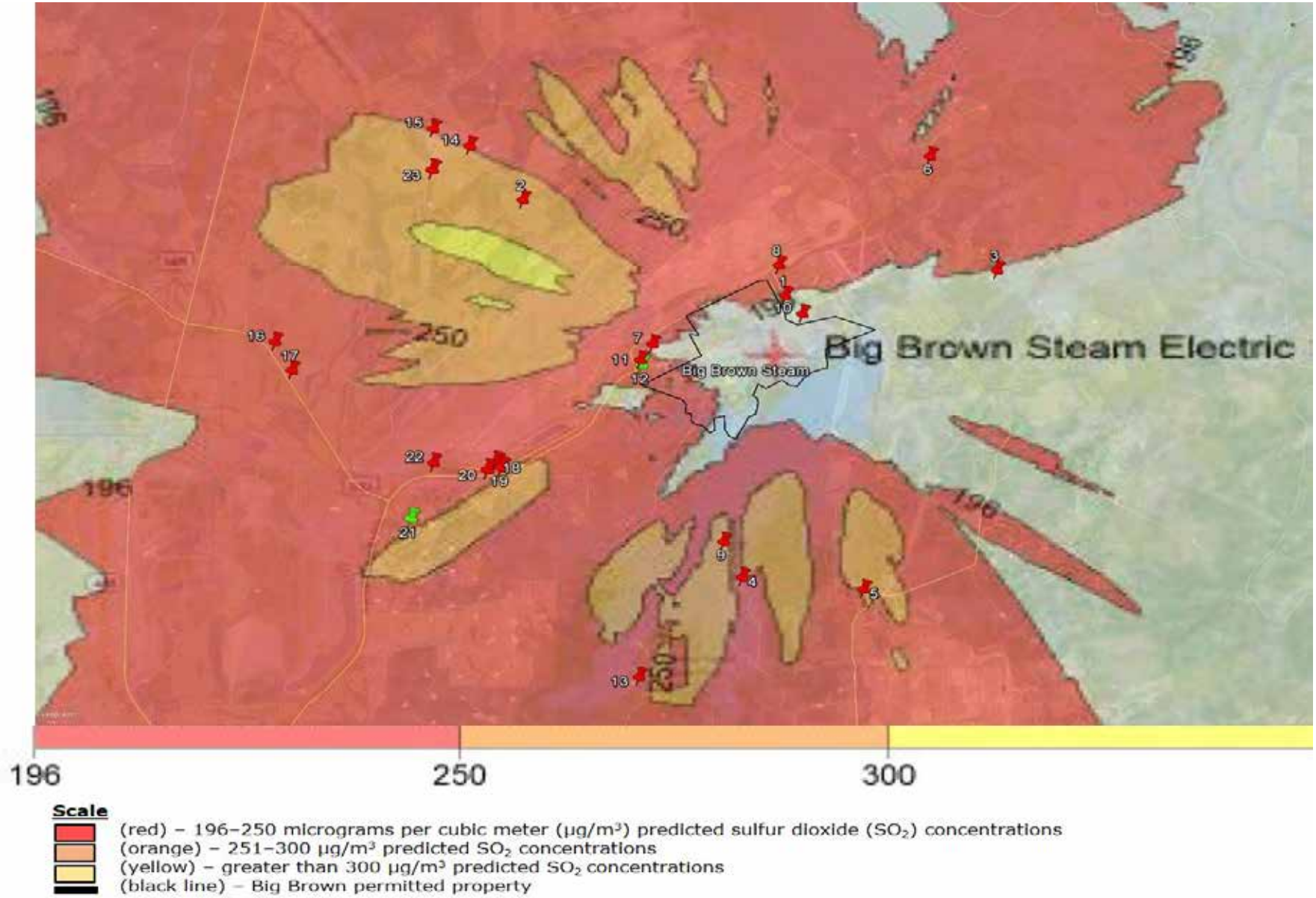

Figure 5: Sierra Club's Predicted Modeled Impacts Using Actual Emissions from 2013-2015 for the Big Brown Area

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Siting Options and Criteria

In 2016, the EPA designated the area surrounding Big Brown nonattainment for SO_2. As a result, the TCEQ intends to deploy an ambient air monitor in the area to characterize SO_2 concentrations near the source. Presently, the TCEQ does not have SO_2 monitors located in the local area surrounding the source. In reviewing potential monitoring sites, the TCEQ focused on complying with the federal requirements listed in 40 Code of Federal Regulations (CFR) Part 58, Appendix E, regarding siting criteria. In addition, the TCEQ evaluated areas for a monitoring site location that would sufficiently characterize air quality around the SO_2 emissions source. This approach included utilizing multiple techniques and guidance provided in the Monitoring TAD, such as modeling, local wind roses that reflect data from 2012-2014, and area site reconnaissance.

The TCEQ evaluated both meteorological data and modeling data to determine the location of an SO_2 monitor. Meteorological data (see Figures 3 and 4) indicate southerly winds predominate in the area, while northerly winds occurred less frequently. This meteorological assessment indicated that reconnaissance to the north of Big Brown should be a priority (since the prominent southerly wind directions would result in emissions from Big Brown more frequently being dispersed north of the facility), but potential sites to the west and south were also investigated.

The modeling analysis results provided in Figure 5 supports the meteorological assessment and suggests that predicted off-property maximum SO_2 concentrations are expected to occur northwest[1] of the Big Brown facility, with pockets of predicted higher and lower concentrations in broad areas to the north, west, and south. Further, the highest predicted modeled concentrations of SO_2 based on actual emissions from the facility is expected northwest of Big Brown, with concentrations above 300 micrograms per cubic meter ($\mu g/m^3$).

After evaluating both the meteorological and modeling data, the TCEQ identified five primary areas of interest for an air monitoring site location: to the north, northwest, west, south-southwest, and south of Big Brown.

Despite favorable meteorological and modeling data, some of these areas were excluded for varying reasons. The predicted highest modeled concentrations northwest of the facility (large yellow shaded area in Figures 5 and 8) are located in an area with active ongoing mining operations that would not allow for public access (see purple outlined areas in Figures 7 and 8) and on the private property of adverse property owners opposed to allowing monitors to be sited on their property (see yellow outlined areas in Figures 7 and 8). The area contains one private road with access restricted by a gate. The TCEQ was not granted access to the area beyond the gate. For these reasons, the properties contained within this area were excluded from monitor siting consideration. Additionally, many other areas, south, southwest, west, and northwest of the facility, where modeling predicted high SO_2 concentrations are not viable for monitoring site deployment due to a large water body south of Big Brown, lack of electrical power, lack of public access, dense vegetation, or adverse property owners.

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[1] Cardinal directions are determined in relation to the Big Brown facility's SO_2 stacks.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Outside of the areas preliminarily excluded, the TCEQ identified 23 potential monitoring sites in the general vicinity. Figures 5-8 depict the potential site locations (red and green pins) and the Big Brown permitted property line (black). For each of the potential sites, the TCEQ researched the property owners on the County Appraisal District website, obtaining all available contact information (including mailing addresses, phone numbers, and email addresses). Multiple attempts to contact each property owner were made via phone calls and messages, email, and mailed correspondence. Sites where the property owners declined monitor placement or were unresponsive to phone calls, mailings, or emails are deemed not viable. Of the 23 monitoring site options, 21 sites are not viable and are indicated by red pins (see Figures 5–8). Sites 12 and 21 are the only identified viable monitoring site options, indicated by green pins. Table 2 details each potential monitoring site's viability.

Using meteorological analyses, the TCEQ identified several potential monitoring sites downwind of the facility to the north and northeast based on predominant wind direction, indicated by the corresponding pin numbers: 1, 6, 8, and 10. The sites identified using meteorological data are not viable locations for monitor siting. Although these areas meet siting criteria, these sites either lack power, lack public site access, are within the permitted property, are on property with active ongoing mining operations, are on privately-used property, or are on the property of owners who have denied access or have been unresponsive to site agreement requests.

Analyzing the modeling data, the TCEQ identified several potential monitoring sites within areas of predicted high SO_2 concentrations, indicated by the corresponding pin numbers: 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23. Most of the sites identified using the predicted modeling data are not viable locations for monitor siting. The few areas that would meet siting criteria, with access to electrical power, are on private property with property owners who have denied access or have been unresponsive to site agreement requests (see Figures 7 and 8). There is also limited public access to the areas of interest.

Two of the sites identified using modeling data (sites 12 and 21) are viable options for monitor placement.

- Site 12 is located 1.5 km to the west of Big Brown. This site is downwind of the source when winds are from the east, 16% of the year on average (see Figure 4). The site offers adequate space, available power, level ground, is close to the facility, and is easily accessible on public roads. Model predicted SO2 concentrations in the area surrounding this site fall within the 196 µg/m3 to 250 µg/m3 range. The property owner is amenable to a site agreement. (see Figures 5-8).
- Site 21 is located 5.2 km to the southwest of Big Brown. This site is downwind of the source when winds are from the northeast, 16% of the year on average (see Figure 4). The site offers adequate space, available power, level ground, is close to the facility, and is easily accessible on public roads. Model predicted SO2 concentrations in the area surrounding this site range from 196 µg/m3 up to 300 µg/m3 (see Figures 5–9). The property owner is amenable to a site agreement.

A monitor located at either of the two viable sites is expected to characterize one-hour SO_2 concentrations for the area. Both sites are located in an area that modeling predicts high SO_2 concentrations. Data from both sites are expected to be similar; thus,

placing a second monitor would not provide additional information. Consequently, only one site, Site 21, will be placed to characterize SO_2 concentrations for the area.

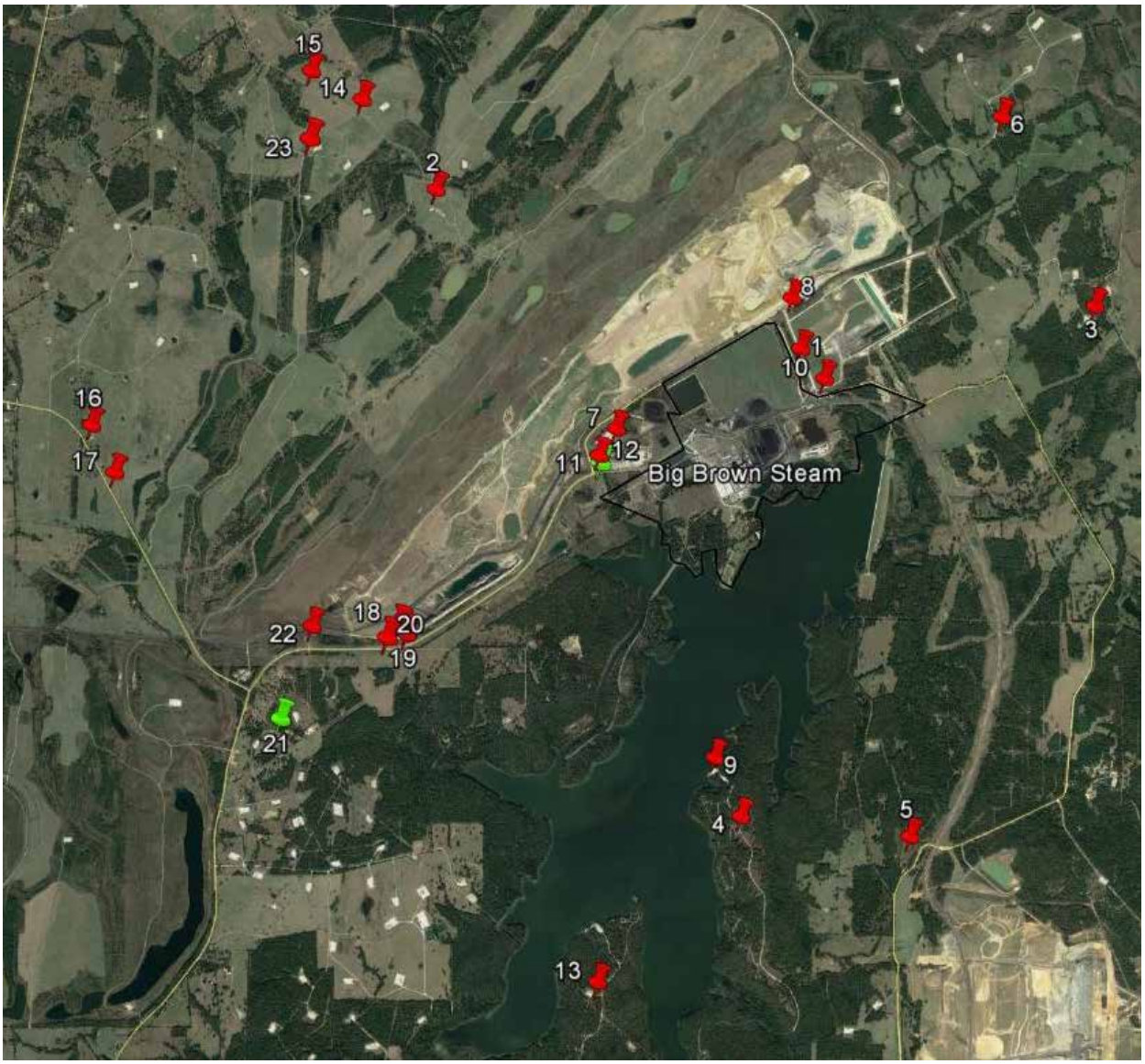
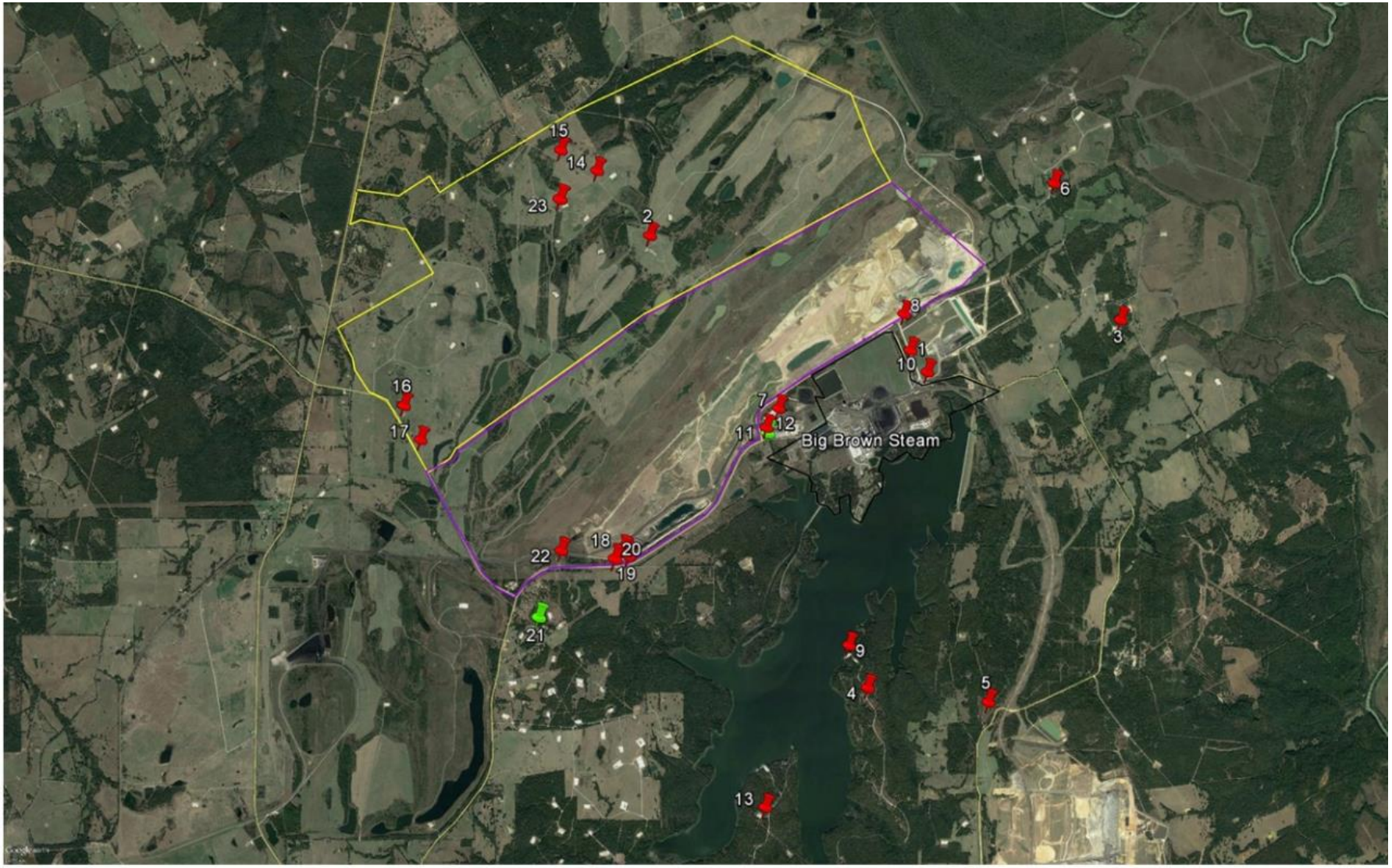


Figure 6: Potential Monitoring Sites for the Big Brown Area

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations



Scale

(purple line) – Properties located within he purple line contain active mining operations.
(yellow line) – Properties located within the yellow line represent non-viable areas due to declining property owners and a lack of public road access.

Figure 7: Non-Viable Areas Near Big Brown

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

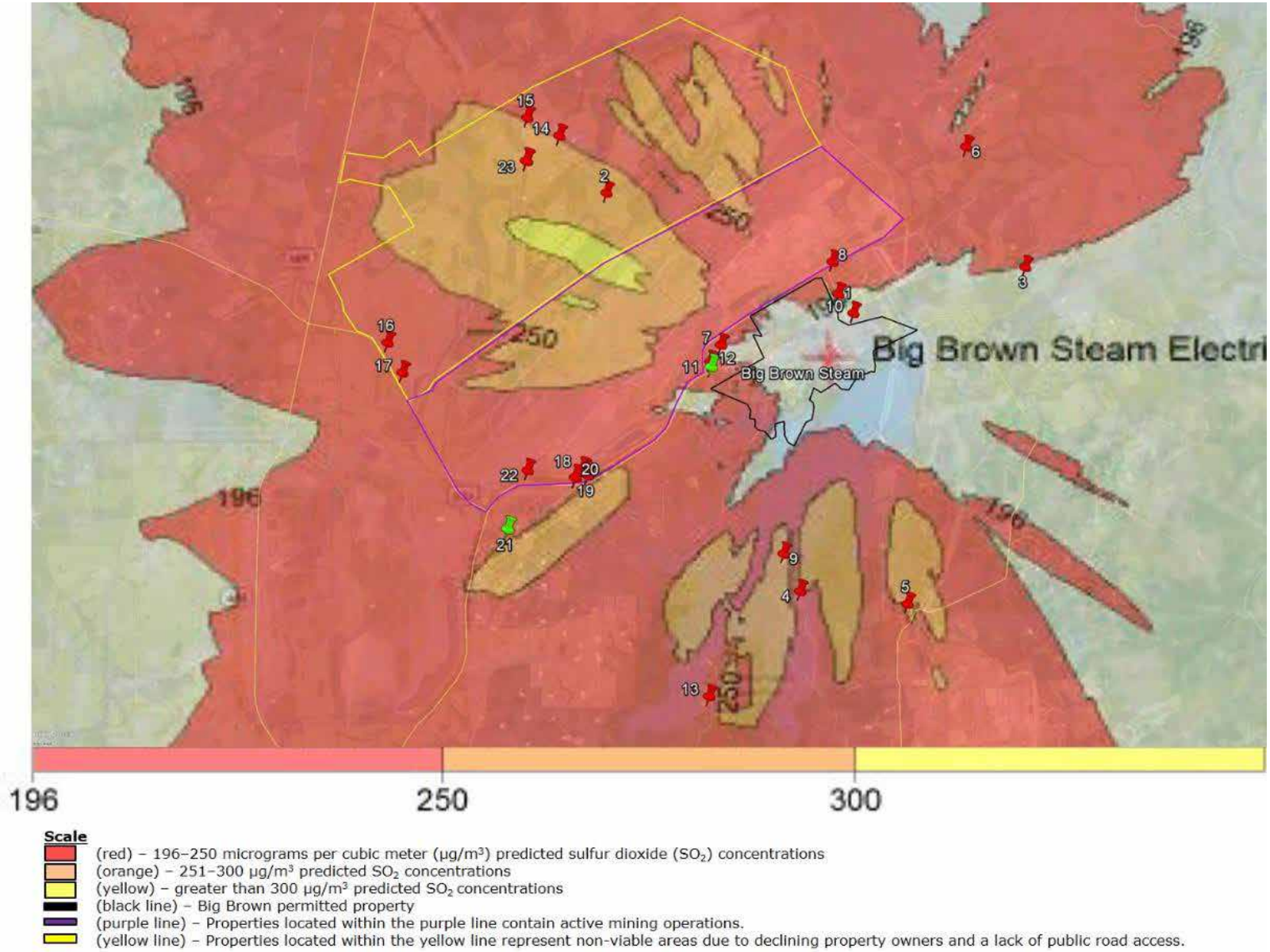


Figure 8: Non-Viable Areas Near Big Brown With Predicted Modeled SO_2 Concentrations

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

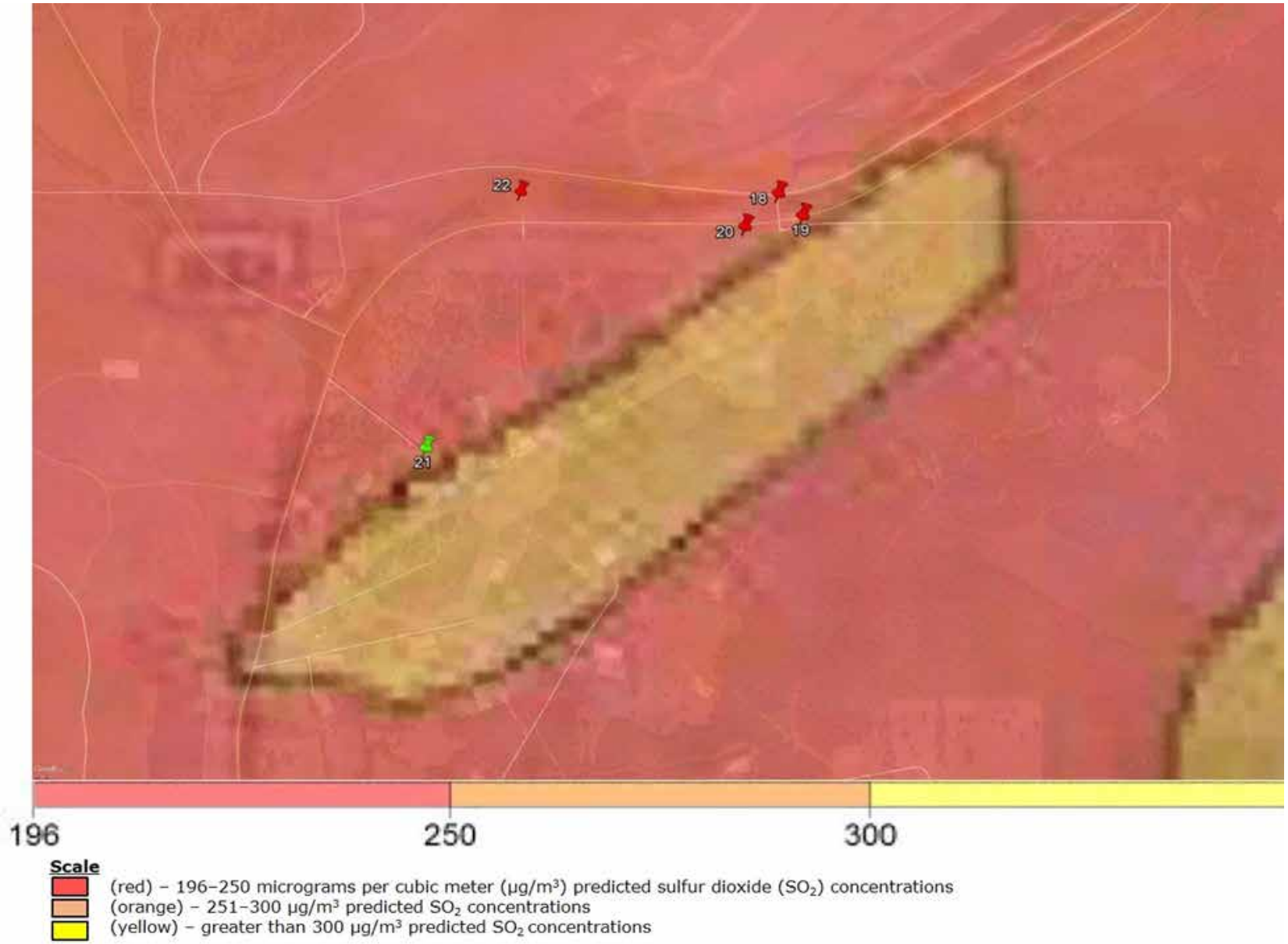


Figure 9: Preferred Site 21 With Predicted Modeled SO_2 Concentrations

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Summary

Logistics (e.g., electricity, vegetation, property access, and siting criteria) and adverse property owners were the most influential factors constraining site placement for the Big Brown area. Necessary siting logistics and property owner amenability are lacking in areas where modeling predicted the highest SO_2 concentrations (northwest of the facility).

Based on current facility operations, available emissions data, logistics, meteorological data, and modeling analyses, Site 21 is the intended location for placement of a new source-oriented ambient SO_2 monitoring station. Historical meteorological data indicate that the area around Site 21 is downwind of Big Brown on average 16% of the year, and the site is located in an area with high predicted modeled SO_2 concentrations.

Pursuant to 40 CFR Sections 51.1201 and 51.1203, the TCEQ will site an air monitoring station at Site 21 to collect air quality data for characterizing potential maximum one-hour ambient SO_2 concentrations near the Big Brown Steam Electric Station.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Table 2: Potential Sites Assessment[1]

Site Number	Big Brown #1	Big Brown #2	Big Brown #3
Location[2]	31.83006, - 96.04986	31.84390, - 96.08720	31.83373, - 96.01967
Distance from SO_2 Source[2]	1,085 m	3,977 m	3,742 m
Wind Direction	SW, S, SE	SW, S, SE	SW, S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	None	Yes; pond (S)	None
Wind Channeling	None	None	None
Downwind[2]	Yes (NNE)	No (NW)	No (NE)
Obstructions and Height	None	None	None
Distance from Site to Obstructions	None	None	None
Road/Site Access	No	No	No
Electricity Available <18 m	Yes	Yes	No
Pros	· Downwind · Level ground · Power available · Space available · Close proximity to source	· Level ground · Power available · Space available · High predicted SO_2 concentrations	· Level ground · Space available
Cons	· No public site access · Heavy vehicle traffic · Within permitted property · Outside area of modeled impact Property owner declined	· Not downwind · No public site access · Unresponsive property owner	· Not downwind · No power · No public site access · Area used for hunting · Unresponsive property owner
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Big Brown #4	Big Brown #5	Big Brown #6
Location[2]	31.78939, - 96.05603	31.78766, - 96.03875	31.85023, - 96.02919
Distance from SO_2 Source[2]	3,301 m	3,449 m	3,771 m
Wind Direction	SW, S, SE	SW, S, SE	SW, S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (W)	None	None
Wind Channeling	None	None	None
Downwind[2]	No (S)	No (SSE)	No (NE)
Obstructions and Height	None	Trees (7 m)	None
Distance from Site to Obstructions	None	Trees (10 m)	None
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	Yes	Yes	Yes
Pros	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Downwind · Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations
Cons	· Not downwind · Property owner declined	· Not downwind · Local obstructions · Dense vegetation · Property owner declined	· Unresponsive property owner
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Big Brown #7	Big Brown #8	Big Brown #9
Location[2]	31.82308, - 96.06875	31.83448, - 96.05076	31.79449, - 96.05867
Distance from SO_2 Source[2]	1,274 m	1,555 m	3,009 m
Wind Direction	SW, S, SE	SW, S, SE	SW, S, SE
Grade	>2%	>2%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	None	Yes; lake (W)
Wind Channeling	None	None	None
Downwind[2]	No (WNW)	Yes (N)	No (S)
Obstructions and Height	Trees (30 m) Water tanks (4 m)	None	Trees (6 m)
Distance from Site to Obstructions	Trees (30 m W, E, NNE) Water tanks (38 m SE)	None	Trees (15 m S)
Road/Site Access	No	No	Yes
Electricity Available <18 m	No	No	Yes
Pros	· Space available · Close proximity to source · High predicted SO_2 concentrations	· Downwind · Close proximity to source · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations
Cons	· Not downwind · Unleveled ground · No power · No public site access · Local obstructions · Heavy vehicle traffic · Property owner declined	· Unleveled ground · No power · No space available · No public site access · Within permitted property · Property owner declined	· Not downwind · Local obstructions · Property owner declined
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Big Brown #10	Big Brown #11	Big Brown #12
Location[2]	31.82743, - 96.04744	31.82075, - 96.07051	31.81998, - 96.07038
Distance from SO_2 Source[2]	1,030 m	1,407 m	1,421 m
Wind Direction	SW, S, SE	SW, S, SE	SW, S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	Yes; lake (SE)	Yes; lake (SE)
Wind Channeling	None	None	None
Downwind[2]	Yes (NE)	No (WNW)	No (WNW)
Obstructions and Height	None	Power pole (7 m)	Trees (10 m)
Distance from Site to Obstructions	None	Powerlines (7 m N, NE, E, SE, S, SW, W, NW)	Trees (27 m NW)
Road/Site Access	No	Yes	Yes
Electricity Available <18 m	Yes	Yes	Yes
Pros	• Downwind • Level ground • Power available • Space available • Close proximity to the source	• Level ground • Power available • Site access • Close proximity to source • High predicted SO_2 concentrations • Agreeable property owner	• Level ground • Power available • Space available • Site access • Close proximity to source • High predicted SO_2 concentrations • Agreeable property owner
Cons	• No public site access • Heavy vehicle traffic • Within permitted property • Mining activity • Outside area of model concentrations • Property owner declined	• Not downwind • No space available • Local obstructions	• Not downwind • Local obstructions
Viable Site (Yes, No, or Preferred)	No	No	Yes

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Big Brown #13	Big Brown #14	Big Brown #15
Location[2]	31.77501, - 96.07069	31.85336, - 96.09816	31.85419, - 96.09998
Distance from SO_2 Source[2]	5,007 m	5,104 m	5,620 m
Wind Direction	SW, S, SE	SW, S, SE	SW, S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (N)	None	None
Wind Channeling	None	None	None
Downwind[2]	No (S)	No (NW)	No (NW)
Obstructions and Height	None	None	None
Distance from Site to Obstructions	None	None	None
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	No	Yes	Yes
Pros	· Level ground · Site access · Space available · High predicted SO_2 concentrations	· Level ground · Power available · Site access · Space available · High predicted SO_2 concentrations	· Level ground · Power available · Site access · Space available · High predicted SO_2 concentrations
Cons	· Not downwind · No power · Property owner declined	· Not downwind · Property owner declined	· Not downwind · Property owner declined
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Big Brown #16	Big Brown #17	Big Brown #18
Location[2]	31.82594, - 96.12574	31.81929, - 96.12007	31.80588, - 96.09111
Distance from SO_2 Source[2]	6,294 m	6,325 m	3,719 m
Wind Direction	SW, S, SE	SW, S, SE	SW, S, SE
Grade	<1%	<1%	>2%
Flood Plains	None	None	Yes
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	None	None	None
Wind Channeling	None	None	None
Downwind[2]	No (W)	No (W)	No (SW)
Obstructions and Height	None	None	Trees (10 m)
Distance from Site to Obstructions	None	None	Trees (10 m E)
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	Yes	Yes	Yes
Pros	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Power available · Space available · Site access · High predicted SO_2 concentrations
Cons	· Not downwind · Property owner unresponsive	· Not downwind · Property owner unresponsive	· Not downwind · Unleveled ground · Local obstructions · Drainage issues/flood prone, property owner not contacted
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Big Brown #19	Big Brown #20	Big Brown #21
Location[2]	31.80517, - 96.09028	31.80499, - 96.09105	31.79778, - 96.10314
Distance from SO_2 Source[2]	3,675 m	3,709 m	5,160 m
Wind Direction	SW, S, SE	SW, S, SE	SW, S, SE
Grade	<1%	<1%	<1%
Flood Plains	None	None	None
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	None	None	None
Wind Channeling	None	None	None
Downwind[2]	No (SW)	No (SW)	No (SW)
Obstructions and Height	None	None	None
Distance from Site to Obstructions	None	None	None
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	Yes	Yes	Yes
Pros	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations · Agreeable property owner
Cons	· Not downwind · Property owner declined	· Not downwind · Property owner declined	· Not downwind
Viable Site (Yes, No, or Preferred)	No	No	Preferred

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Big Brown #22	Big Brown #23
Location[2]	31.80594, -96.09990	31.84816, -96.10015
Distance from SO_2 Source[2]	4,535 m	5,303 m
Wind Direction	SW, S, SE	SW, S, SE
Grade	<1%	Unknown
Flood Plains	None	Unknown
Mountain/Valley Winds	None	None
Water Body Within 1,000 m	None	None
Wind Channeling	None	None
Downwind[2]	No (SW)	No (NW)
Obstructions and Height	None	Unknown
Distance from Site to Obstructions	None	Unknown
Road/Site Access	Yes	Yes
Electricity Available <18 m	Yes	Yes
Pros	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Power available · Space available · Site access · High predicted SO_2 concentrations
Cons	· Not downwind · Potential underground lines and pipelines · Property owner declined	· Not downwind · Property owner declined (site not evaluated further)
Viable Site (Yes, No, or Preferred)	No	No

[1]Based on 40 Code of Federal Regulations Part 58 and SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document
[2]Based on Google Earth
E – east
m – meter
N – north
NE – northeast
NNE – north-northeast
NW – northwest
S – south
SE – southeast
SO_2 – sulfur dioxide
SSE – south-southeast
SW – southwest
W – west
WNW – west-northwest
> – greater than
< – less than
– number
% – percent

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

References

Griffith, G. E., S. A. Bryce, J. M. Omernik, J. A. Comstock, A. C. Rogers, B. Harrison, S. L. Hatch, and D. Bezanson. *Ecoregions of Texas*. (2 sided color poster with map, descriptive text, summary tables, and photographs). Reston, Virginia: U.S. Geological Survey, 2004. Scale 1:2,500,000.

"IEM : Site Locator." Iowa Environmental Mesonet. 2016. Accessed April 06, 2016. link https://mesonet.agron.iastate.edu/sites/locate.php?network=TX_ASOS.

U.S. EPA. EPA Docket ID: EPA-HQ-OAR-2014-0464. *Final Technical Support Document for the Designation Recommendations for the 2010 Sulfur Dioxide National Ambient Air Quality Standards (NAAQS) – Supplement for Four Areas in Texas Not Addressed in June 30, 2016, Version (EPA-HQ-OAR-2014-0464-0434)*. pp. 8-29. 2016. Accessed April 26, 2017. link https://www.regulations.gov/docket?D=EPA-HQ-OAR-2014-0464.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Martin Lake Electrical Station

Source Information

- Name: Martin Lake Electrical Station (Martin Lake) (Figure 11)
- Owner: Luminant Generation Company, LLC
- Facility function: electric generation
- Location: 32.25965, -94.57033, TCEQ Region 5, Rusk County, Texas
- SO_2 emissions data: 62,735 tons (2013), 53,660 tons (2014), 22,930 tons (2015)
- Long-term emissions trend: decreasing, 63 % decrease from 2013 to 2015 due to decreased operations
- Emission profile: operational year-round
- Stack height(s): three stacks, S-1, S-2, and S-3, each 138 m high, currently active
- SO_2 emission controls: multiple wet scrubbers, electrostatic precipitators, and fabric filters
- Permit related data: Federal Operating Permit number 053

Existing Air Monitoring Sites

The TCEQ operates three ambient air monitoring sites within a 100 km radius of Martin Lake. Table 3 details these monitoring sites in order of proximity. While many factors affect where maximum SO_2 ground level concentrations would be expected to occur, generally they are expected to occur closer to the emission source. Although one location currently monitors SO_2, none of the existing sites are within a reasonable proximity to the source to characterize expected maximum SO_2 ground level concentrations.

Table 3: Air Monitoring Sites Near Martin Lake

Site	Distance from Martin Lake	Current Sulfur Dioxide (SO_2) Monitoring	SO_2 Design Value (2013–2015)
Longview	18 km northwest	No	Not applicable
Karnack	60 km northeast	Yes	46 parts per billion
Tyler Airport Relocated	79 km west	No	Not applicable

km – kilometer

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Settings and Surroundings

The primarily rural area surrounding Martin Lake is located in the southern portion of the Tertiary Uplands ecoregion of the South Central Plains. This area is the western edge of the southern coniferous forest belt and blanketed by dense pine and hardwood forests (Griffith et al. 2004). The elevation is roughly 122 m as shown in Figure 10. The area is speckled with inactive oil and gas drilling pad sites with limited power accessibility. During reconnaissance it was noted that the vegetation was significantly thicker and the trees were significantly taller in some locations as compared to the satellite image shown in Figure 16. Mountain and valley wind channeling, or other terrain related meteorological impacts, are not expected in the area surrounding Martin Lake.

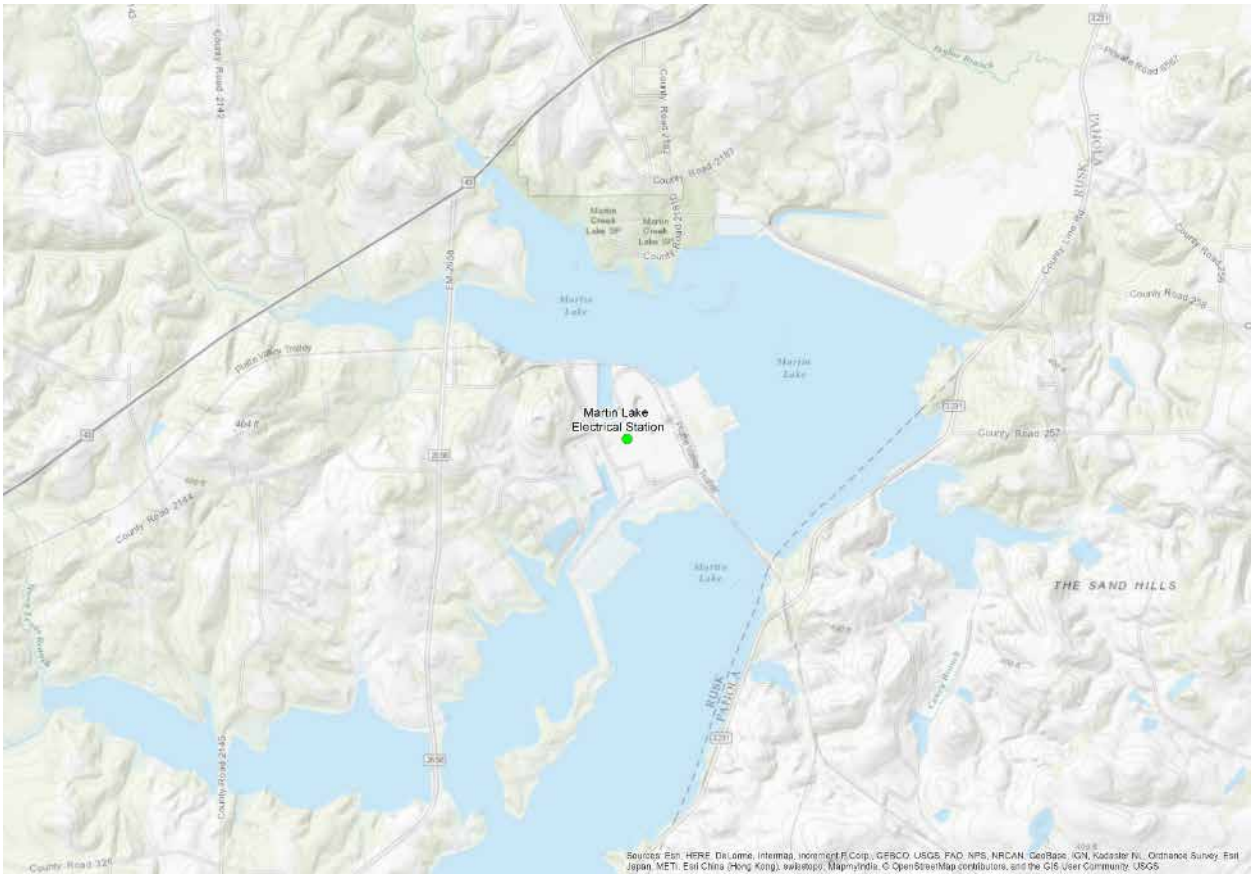


Figure 10: Martin Lake Area Elevation Map

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Figure 11: Martin Lake Sulfur Dioxide (SO_2) Stacks and Emissions for 2013

TPY – tons per year

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Meteorological Data

Figure 12 provides illustrations of local area annual average wind speed and direction for 2012, 2013, and 2014 from meteorological sensors at the Longview Airport, located 18 km northwest of Martin Lake. Figure 13 illustrates the 2012-2014 annual average wind speed. The length of each wind rose bar corresponds to the frequency of the wind coming from the indicated direction by percentage. Based on the analysis of the 2012-2014 wind data, the dominant wind flow direction for the area is 125 degrees southeast to 215 degrees south-southwest. Approximately 40% of the average area wind flows move from these directions. Over this three year period, calm winds (0-2 mph) occurred on average 19% of the time, and wind speeds averaged 6.9 mph (Iowa Environmental Mesonet 2016).

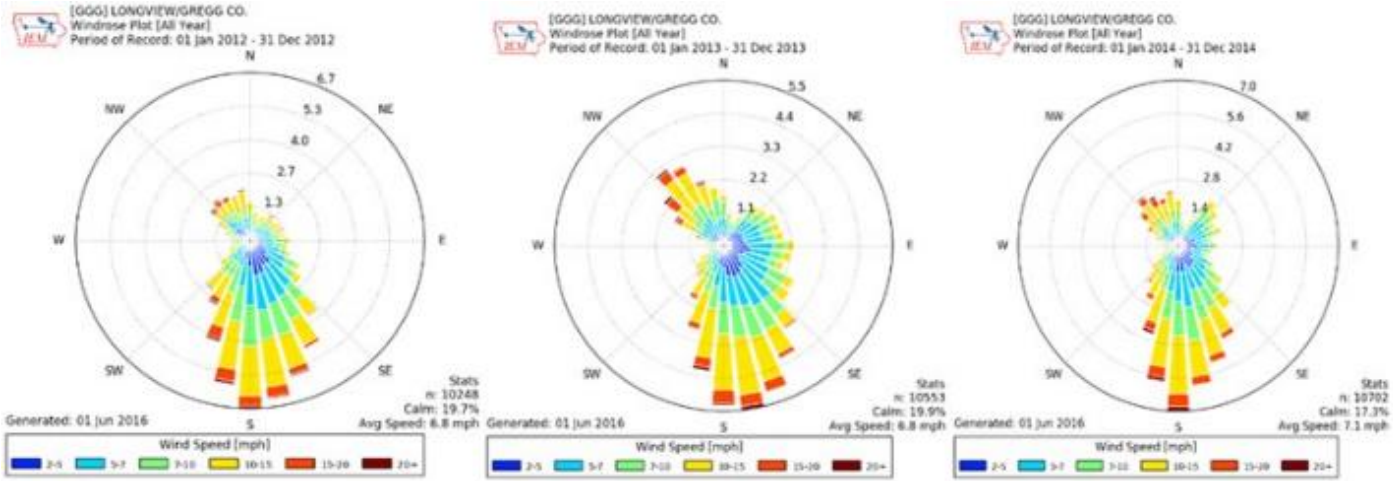


Figure 12: (From left to right) 2012, 2013, and 2014 Individual Wind Rose Plots

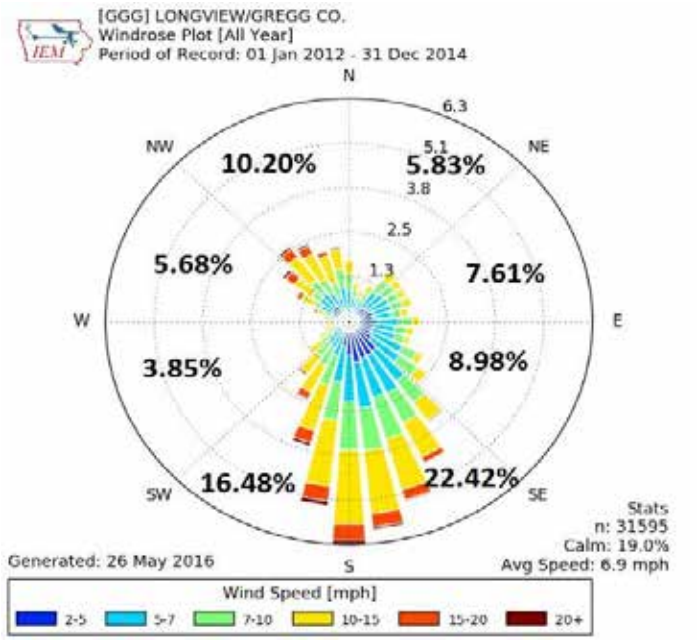


Figure 13: 2012-2014 Combined Average Wind Rose Plot

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Modeling Analysis for Monitoring Site Placement

The Monitoring TAD suggests that modeling is one technique that may be used to assist in identifying potential monitoring sites. The Modeling TAD notes that for area designations under the 2010 SO_2 NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified.

In developing area designations for the 2010 SO_2 NAAQS, the AERMOD modeling analysis provided by the Sierra Club in March 2016, was cited in the *Final Technical Support Document for the Designation Recommendations for the 2010 Sulfur Dioxide National Ambient Air Quality Standards (NAAQS) – Supplement for Four Areas in Texas Not Addressed in June 30, 2016, Version* (EPA docket identification number, EPA-HQ-OAR-2014-0464-0434) as relevant information considered by the EPA in the Martin Lake designation decision. Given the EPA's reliance on the 2016 Sierra Club modeling for designation purposes, the TCEQ has used this modeling as one of the tools to inform possible SO_2 monitor placement recommendations near Martin Lake. The use of the 2016 Sierra Club modeling analysis for possible monitor placement decisions does not infer the TCEQ's concurrence with the use of this modeling analysis for any other purpose.

Figure 14 illustrates the Sierra Club's predicted modeled impacts for the 2013-2015 actual facility emissions. In this figure, the TCEQ viable air monitoring site is identified with a green pin and non-viable sites are identified with red pins.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

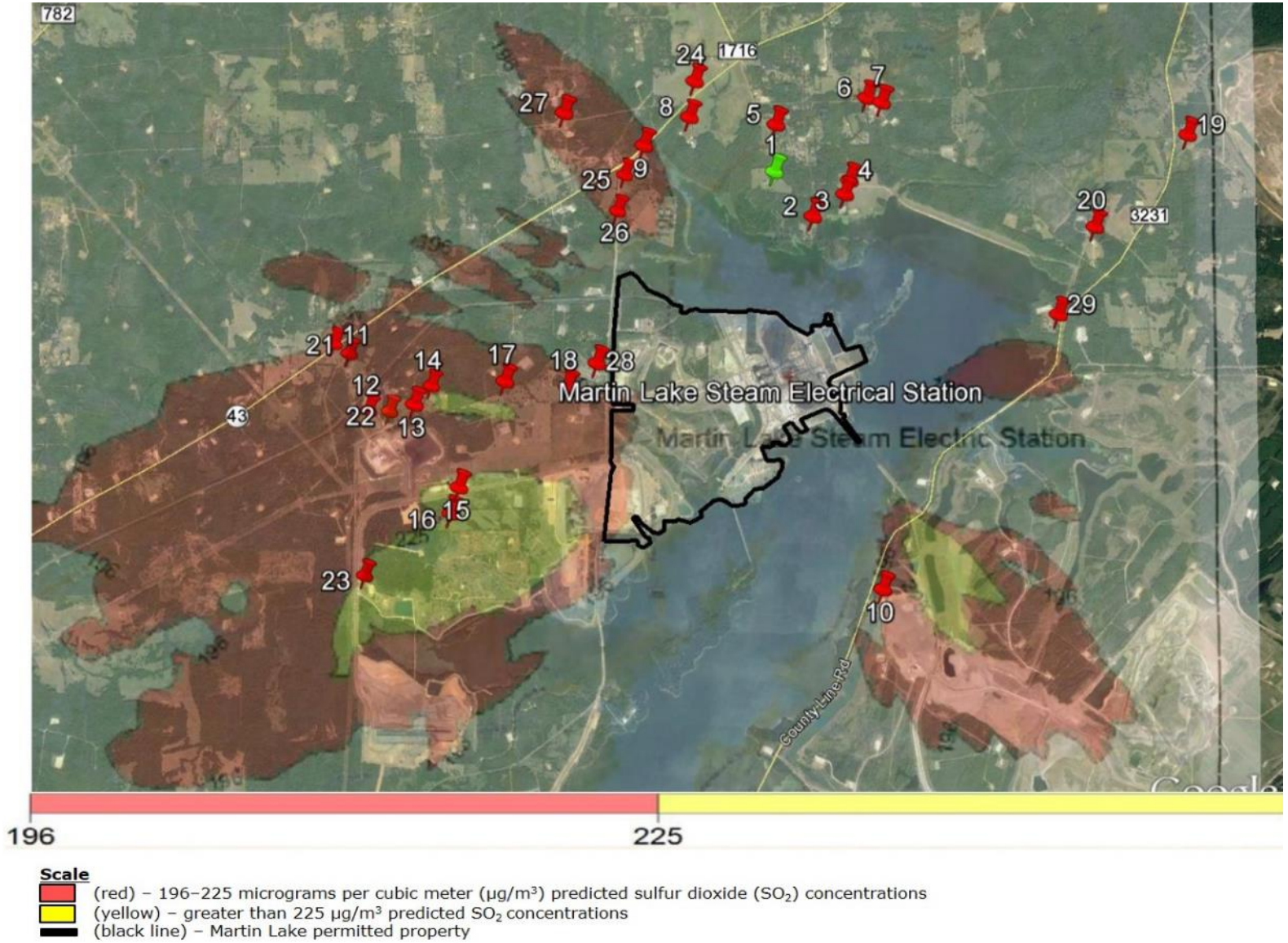


Figure 14: Sierra Club's Modeled Impacts Using Actual Emissions From 2013–2015 for the Martin Lake Area

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Siting Options and Criteria

In 2016, the EPA designated the area surrounding Martin Lake as nonattainment. As a result, the TCEQ intends to site an ambient air monitor in the area to characterize SO_2 concentrations near the source. Presently, the TCEQ does not have SO_2 monitors located in the local area surrounding the source. In reviewing potential monitoring sites, the TCEQ focused on complying with the federal requirements listed in 40 CFR Part 58, Appendix E, regarding siting criteria. In addition, the TCEQ evaluated areas for a monitoring site location that would sufficiently characterize air quality around the SO_2 emissions source. This approach included utilizing multiple techniques and guidance provided in the Monitoring TAD, such as modeling, local wind roses that reflect data from 2012-2014, and area site reconnaissance.

The TCEQ evaluated both meteorological data and modeling data to inform potential locations for an SO_2 monitor. Meteorological data (see Figures 12, 13, and 15) indicate winds predominate with a strong southerly component in the area while northwesterly and easterly winds occurred less often around 16% of the time. The easterly winds were consistently 2 to 15 mph and the northwesterly winds ranged up to over 20 mph. This meteorological assessment indicated that reconnaissance to the north of Martin Lake should be a priority (since the prominent southerly wind directions would result in emissions from Martin Lake more frequently being dispersed north of the facility), but potential sites to the west and southeast were also investigated.

The modeling analysis results provided in Figures 14 and 17 predicted that off-property maximum SO_2 concentrations (i.e., average one-hour SO_2 concentrations greater than 196 $\mu g/m^3$) are expected to occur east,[2] southeast, southwest, west, northwest and north of Martin Lake, with isolated pockets of predicted higher and lower concentrations. Further, the highest predicted modeled concentrations of SO_2 based on source actual emissions was predicted to the southwest of Martin Lake, with predicted concentrations above 225 $\mu g/m^3$. (Modeled concentrations above 225 $\mu g/m^3$ were also predicted to the southeast and west of the facility).

After evaluating both the meteorological and modeling data, the TCEQ identified five primary areas of interest for an air monitoring site location: to the north, northeast, southeast, southwest, and west of Martin Lake.

Despite favorable meteorological and modeling data, some of these areas were excluded for varying reasons. The highest modeled concentrations predicted southwest and southeast of the facility are located on facility property or contain active mining operations that would not allow for public access; thus, these areas were excluded from monitor siting (see Figures 16 and 17). Other areas with projected high SO_2 concentrations are not viable for monitoring site deployment due to a large water body south of Martin Lake, lack of electrical power, dense vegetation, or adverse property owners. Specifically, areas to the west of Martin Lake property (west of pins 11, 12, 21 and 23 in Figures 16 and 17) lack the resources necessary for an ambient air monitoring station. This far western area of predicted modeled concentrations above the standard is heavily forested, lacks power, and lacks public road accessibility.

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[2] Cardinal directions are determined in relation to the Martin Lake facility's SO_2 stacks.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

The TCEQ identified 29 potential monitoring sites in the general vicinity of the source, in areas not preliminarily excluded. Figures 14, 15, 16, and 17 depict the potential site locations (red and green pins) and the Martin Lake permitted property line (black). For each of the potential sites, the TCEQ researched the property owners on the County Appraisal District website, obtaining all available contact information (including mailing addresses, phone numbers, and email addresses). Multiple attempts to contact each property owner were made via phone calls and messages, email, and mailed correspondence. Sites where the property owners declined monitor placement or were unresponsive to phone calls, mailings, or emails are deemed not viable. Of the 29 monitoring site options, 28 sites (numbers 2–29) are not viable and are indicated by red pins (see Figures 14-17). Site 1 is the only identified viable monitoring site, indicated by a green pin. Table 4 details each potential monitoring site's viability.

Using meteorological analyses, the TCEQ identified several potential monitoring sites downwind of the facility to the north based on predominant wind direction, indicated by the corresponding pin numbers: 1, 2, 3, 4, 5, 6, 7, 8, and 24. The area directly downwind of the facility contains a large water body surrounded by dense vegetation and trees of significant height to interfere with siting criteria. North of the water body there are some scattered public roads, isolated plots of cleared land, and occasional electricity sources. The few locations identified with the necessary electricity availability and public access were found to be unsuitable due to area obstructions (trees and dense vegetation), lack of access due to hunting lease or cell phone tower conflicts, or lacking sufficient space for monitor placement. Additionally, property owners in the non-forested areas were either not responsive or not amenable to site placement inquiries.

Analyzing the modeling data, the TCEQ identified the following potential monitoring sites, indicated by the corresponding pin numbers: 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 25, 26, and 27. Siting an air monitor in an area with the highest predicted modeled off-property concentrations southeast or west of Martin Lake is not feasible. The area's extensive forest contains dense vegetation and trees of a sufficient height and leaf canopy density that would interfere with the normal airflow necessary to meet air monitoring station siting criteria. There is also limited public access to the areas of interest. The few areas that would meet siting criteria, with power, are on private property, and property owners have denied access or have been unresponsive to site agreement requests. In addition, areas to the southeast and southwest of the facility contain active mining operations in three large geographic areas with predicted modeled concentrations estimated greater than 196 µg/m^3 (see Figures 16 and 17). These active mining areas, to the southwest and to the southeast, prevent public accessibility and are not suitable for an ambient air monitoring station.

Additionally, the TCEQ identified potential sites 19, 20, 28 and 29. Reconnaissance was performed on these sites because they aligned with the Sierra Club's 2015 predicted modeled concentrations for this area, published in the *Texas Technical Support Document* (EPA docket ID number, EPA-HQ-OAR-2014-0464-0144) (September 18, 2015). However, these sites are not suitable for monitor placement because they lack electrical power, are on private property with hunting leases, and the property owners were not amenable to monitor siting.

Site 1, identified as a potential area of maximum concentrations using meteorological data, is considered viable and meets logistical and siting criteria. Site 1 is located approximately 2.2 km north of the Martin Lake facility. This site is downwind of the

source when winds are from the south, approximately 40% of the year on average (see Figure 15). The site offers adequate space, available power, is close to the facility, and is easily accessible on public roads. The property owner has indicated interest and signed a site agreement. Although there are trees around the site, there is sufficient distance to meet and maintain siting criteria. More than one SO_2 monitor in the area would provide additional data to appropriately characterize SO_2 concentrations in multiple directions from the facility since the modeling indicates the predicted modeled concentrations are split between north, southeast, and southwest of the facility. However, no viable sites could be located southeast or southwest of the facility in areas of high predicted SO_2 concentrations; thus, only one site was selected. Site 1 is expected to sufficiently characterize the area SO_2 concentrations based on the proximity to the facility and meteorological data.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

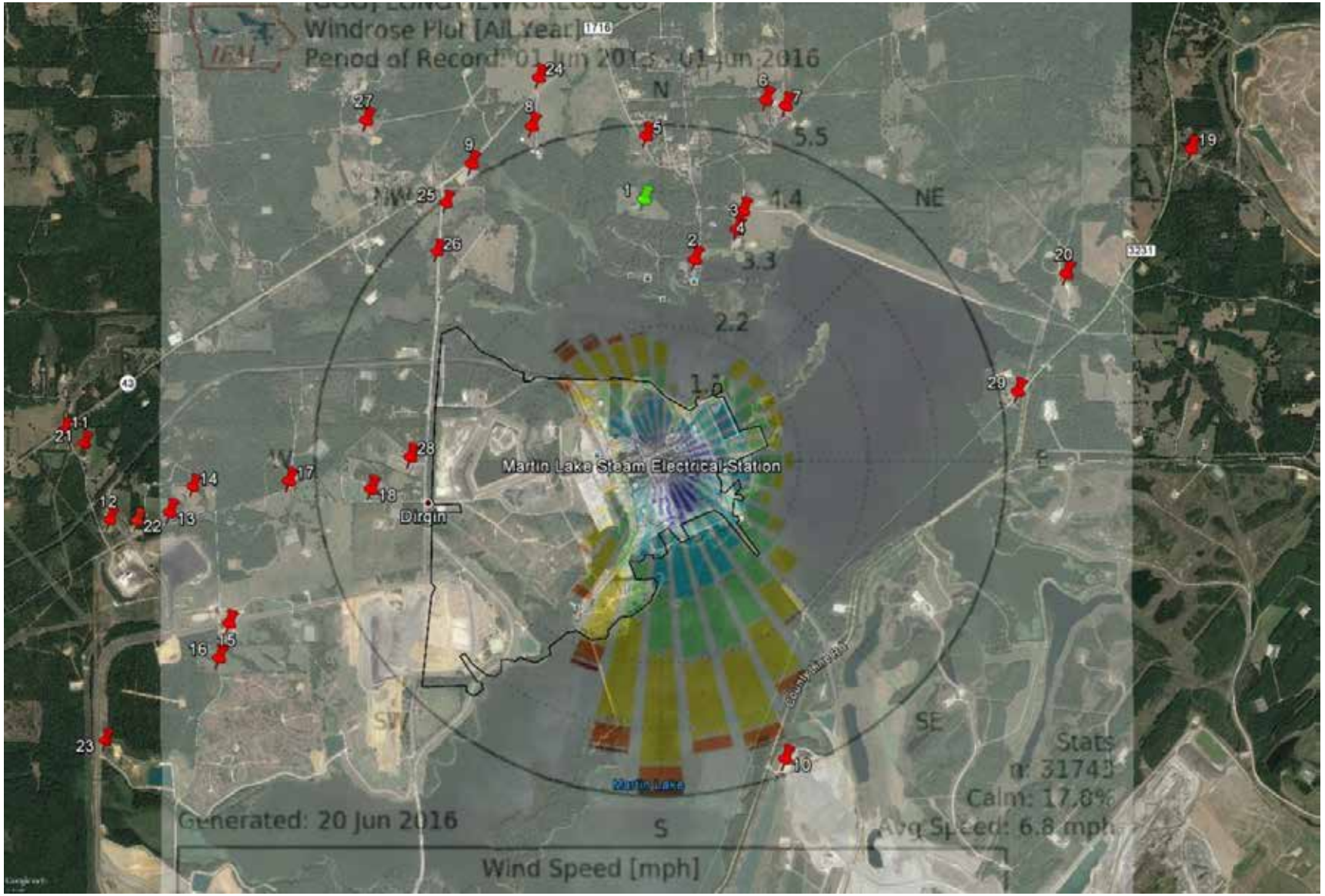

Figure 15: 2012-2014 Wind Rose Overlay for the Martin Lake Area

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

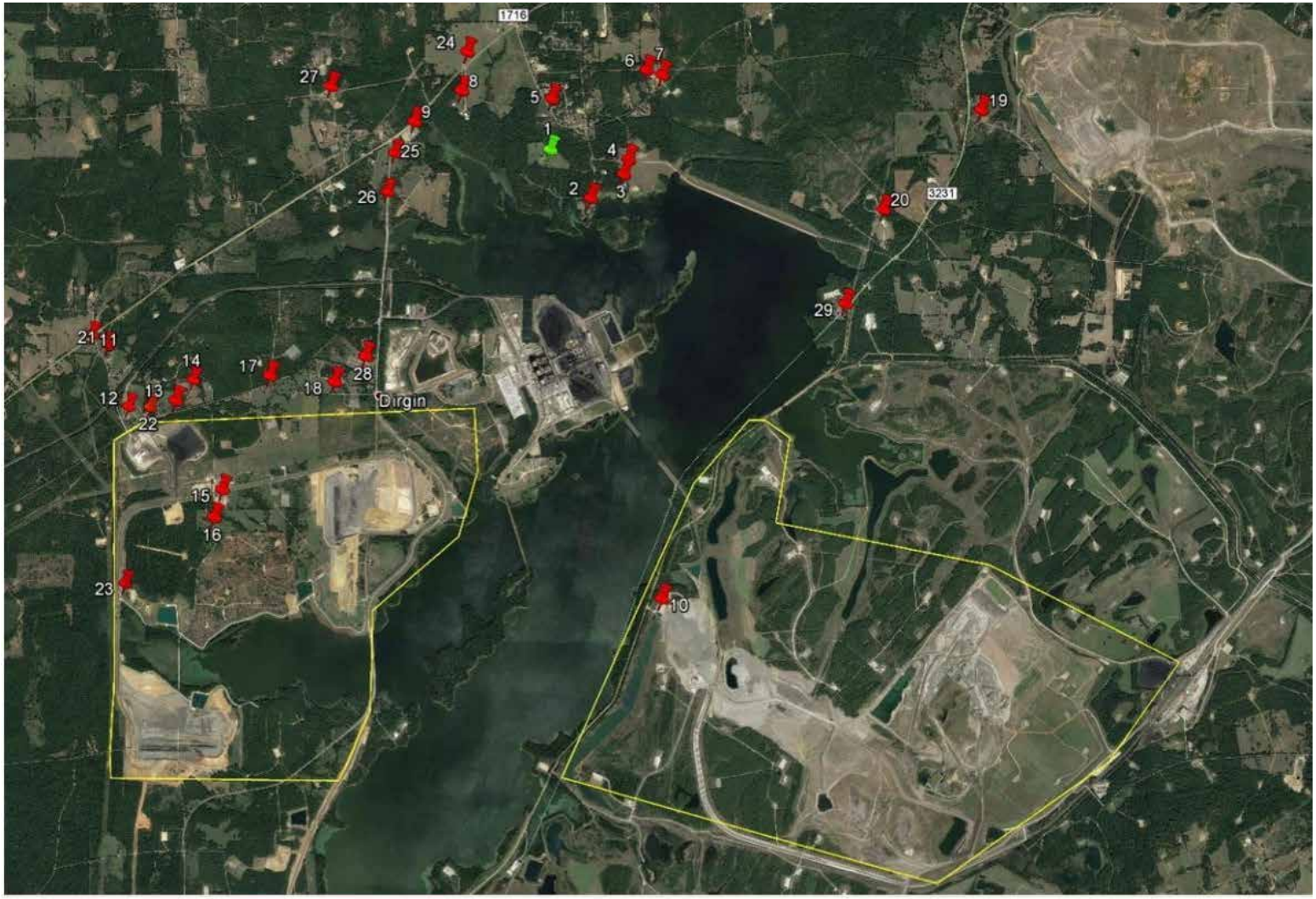

Figure 16: Active Mining Areas Near Martin Lake

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

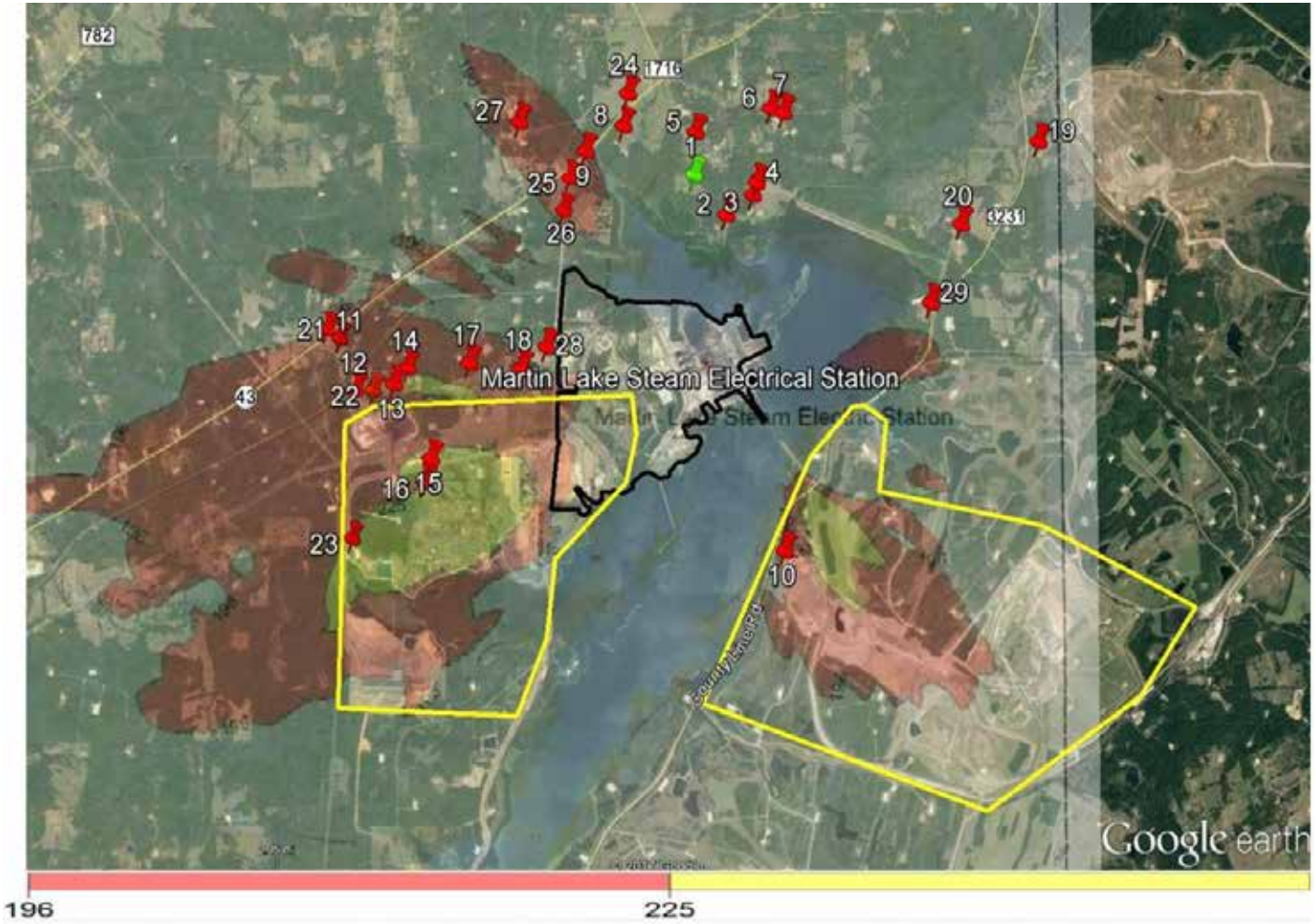

Figure 17: Active Mining Areas Near Martin Lake With Predicted Modeled SO_2 Concentrations

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Summary

Logistics (e.g., electricity, vegetation, property access, and siting criteria) and adverse property owners were the most influential factors constraining site placement for the Martin Lake area. Necessary siting logistics and property owner amenability are lacking in areas where modeling predicted the highest SO_2 concentrations (southwest of the facility).

Based on current facility operations, available emissions data, logistics, meteorological data, and modeling analyses, Site 1 is the intended location for placement of a new source-oriented ambient SO_2 monitoring station. Historical meteorological data indicate that the area around Site 1 is downwind of Martin Lake on average 40% of the year and is close enough to the facility to characterize the SO_2 concentrations for the area.

Pursuant to 40 CFR Sections 51.1201 and 51.1203, the TCEQ will site an air monitoring station near Martin Lake at Site 1 to collect air quality data for characterizing potential maximum one-hour ambient SO_2 concentrations near the Martin Lake Electrical Station.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Table 4: Potential Sites Assessment[1]

Site Number	Martin Lake #1	Martin Lake #2	Martin Lake #3
Location[2]	32.27808, - 94.57084	32.27377, - 94.56651	32.27591, - 94.56296
Distance from SO_2 Source[2]	2,200 m	1,615 m	1,940 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<2%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	Yes; lake (S)	Yes; lake (S)
Wind Channeling	None	None	None
Downwind[2]	Yes (N)	Yes (NNE)	Yes (NNE)
Obstructions and Height	Trees (12 m)	Trees (30 m)	Trees (30 m)
Distance from Site to Obstructions	Trees (43 m S, 24 m N, 107 m E)	Trees (21 m W, 63 m S)	Trees (21 m W, 63 m S)
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	Yes	Yes	No
Pros	· Downwind · Power available · Space available · Site access · Close proximity to source · Agreeable property owner	· Downwind · Level ground · Power available · Site access · Close proximity to source	· Downwind · Level ground · Space available · Site access · Close proximity to source
Cons	· Local obstructions · Unleveled ground	· No space available · Local obstructions · Unresponsive property owner	· No power · Local obstructions · Property owner declined
Viable Site (Yes, No, or Preferred)	Preferred	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #4	Martin Lake #5	Martin Lake #6
Location[2]	32.27725, - 94.56243	32.28261, - 94.57066	32.28521, - 94.56049
Distance from SO_2 Source[2]	2,100 m	2,600 m	3,010 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	Yes; lake (S)	Yes; lake (S)
Wind Channeling	None	None	None
Downwind[2]	Yes (NNE)	Yes (N)	Yes (NNE)
Obstructions and Height	Trees (30 m)	Trees (12 m)	Trees (12 m)
Distance from Site to Obstructions	Trees (35 m S, 68 m W)	Trees (62 m S, 102 m W)	Trees (20 m W, 35 m N, 26 m E)
Road/Site Access	Yes	Yes	No
Electricity Available <18 m	No	No	No
Pros	· Downwind · Level ground · Space available · Site access · Close proximity to source	· Downwind · Level ground · Space available · Site access · Close proximity to source	· Downwind · Level ground · Space available · Close proximity to source
Cons	· No power · Local obstructions · Property owner declined	· No power · Local obstructions · Unresponsive property owner	· No power · No site access · Dense vegetation · Local obstructions · Unresponsive property owner
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #7	Martin Lake #8	Martin Lake #9
Location[2]	32.28478, - 94.55883	32.28332, - 94.58033	32.28060, - 94.58543
Distance from SO_2 Source[2]	3,000 m	2,780 m	2,710 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	Yes; lake (SW)	Yes; lake (SE)
Wind Channeling	None	None	None
Downwind[2]	Yes (NNE)	Yes (NNW)	No (NW)
Obstructions and Height	Trees (12 m)	Trees (10 m)	Trees (15 m)
Distance from Site to Obstructions	Trees (23 m SW, 22 m E)	Trees (62 m S, 46 m W)	Trees (75 m SE)
Road/Site Access	Yes	No	Yes
Electricity Available <18 m	Yes	No	No
Pros	· Downwind · Level ground · Power available · Site access · Close proximity to source	· Downwind · Level ground · Space available · Close proximity to source · High predicted SO_2 concentrations	· Level ground · Space available · Site access · Close proximity to source · High predicted SO_2 concentrations
Cons	· No space available · Dense vegetation · Local obstructions · Unresponsive property owner	· No power · No site access · Local obstructions · Property owner declined	· Not downwind · No power · Local obstructions · Unresponsive property owner
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #10	Martin Lake #11	Martin Lake #12
Location[2]	32.23796, - 94.55886	32.26160, - 94.61984	32.25520, - 94.61596
Distance from SO_2 Source[2]	2,650 m	4,660 m	4,240 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (W, N, NW)	No	No
Wind Channeling	None	None	None
Downwind[2]	No (SE)	No (W)	No (W)
Obstructions and Height	Trees (12 m)	Barn (5 m)	Shipping container (3 m)
Distance from Site to Obstructions	Trees (92 m NW)	Barn (12 m E)	Shipping container (8 m N)
Road/Site Access	No	Yes	No
Electricity Available <18 m	No	Yes	Yes
Pros	· Level ground · Space available · Close proximity to source · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · High predicted SO_2 concentrations
Cons	· Not downwind · No power · Mining activity · No site access · Local obstructions · Property owner declined	· Not downwind · Local obstructions · Private hunting lease · Property owner declined	· Not downwind · No site access · Railroad to the east · Local obstructions · Property owner declined
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #13	Martin Lake #14	Martin Lake #15
Location2	32.25564, - 94.61095	32.25757, - 94.60898	32.24769, - 94.60595
Distance from SO2 Source2	3,820 m	3,640 m	3,560 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	No	No	No
Wind Channeling	None	None	None
Downwind2	No (W)	No (W)	No (W)
Obstructions and Height	None	None	None
Distance from Site to Obstructions	None	None	None
Road/Site Access	No	Yes	No
Electricity Available <18 m	No	Yes	Yes
Pros	· Level ground · High predicted SO_2 concentrations · Space available	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · High predicted SO_2 concentrations
Cons	· Not downwind · No power · No site access · Property owner declined	· Not downwind · Unresponsive property owner	· Not downwind · No site access · Property owner declined
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #16	Martin Lake #17	Martin Lake #18
Location[2]	32.24522, - 94.60680	32.25787, - 94.60089	32.25731, - 94.59395
Distance from SO_2 Source[2]	3,760 m	2,870 m	2,240 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	No	Yes; retention pond (E)
Wind Channeling	None	None	None
Downwind[2]	No (W)	No (W)	No (W)
Obstructions and Height	None	Trees (10 m)	Trees (10 m)
Distance from Site to Obstructions	None	Trees (16 m W)	Trees (16 m W, N, S)
Road/Site Access	No	No	Yes
Electricity Available <18 m	No	Yes	Yes
Pros	· Level ground · Space available · High predicted SO_2 concentrations	· Level ground · Power available · Space available · High predicted SO_2 concentrations	· Level ground · Power available · Close proximity to the source · Space available · Site access · High predicted SO_2 concentrations
Cons	· Not downwind · No power · No site access · Property owner declined	· Not downwind · No site access · Local obstructions · Unresponsive property owner	· Not downwind · Local obstructions · Unresponsive property owner
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #19	Martin Lake #20	Martin Lake #21
Location[2]	32.28167, - 94.52449	32.27272, - 94.53505	32.26041, - 94.61824
Distance from SO_2 Source[2]	4,930 m	3,640 m	4,475 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	No	Yes; lake (SW)	Yes; pond (E)
Wind Channeling	None	None	None
Downwind[2]	No (ENE)	No (ENE)	No (W)
Obstructions and Height	None	None	Trees (15 m)
Distance from Site to Obstructions	None	None	Trees (35 m E, 15 m W)
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	Yes	No	Yes
Pros	· Level ground · Power available · Space available · Site access	· Level ground · Space available · Site access	· Level ground · Site access · Power available · High predicted SO_2 concentrations
Cons	· Not downwind · Unresponsive property owner	· Not downwind · No power · Private hunting lease · Property owner declined	· Not downwind · Local obstructions · No space available, property owner not contacted
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #22	Martin Lake #23	Martin Lake #24
Location[2]	32.25520, - 94.61363	32.24076, - 94.61699	32.28699, - 94.57995
Distance from SO_2 Source[2]	4,115m	4,870 m	3,015 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	Unknown
Mountain/Valley Winds	None	None	Unknown
Water Body Within 1,000 m	No	Yes, pond (E), lake (SE)	Yes; lake (S)
Wind Channeling	None	None	None
Downwind[2]	No (W)	No (SW)	Yes (NNW)
Obstructions and Height	House (5 m)	None	None
Distance from Site to Obstructions	House (12 m NW)	None	Unknown
Road/Site Access	Yes	No	None
Electricity Available <18 m	Yes	Yes	None
Pros	· Level ground · Power available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · High predicted SO_2 concentrations	· Downwind · Level ground · Power available · Space available · Site access
Cons	· Not downwind · No space available · Railroad to the east · Local obstructions Property owner declined	· Not downwind · No public site access, property owner not contacted	· Property owner declined during preliminary analysis
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #25	Martin Lake #26	Martin Lake #27
Location[2]	32.27792, - 94.58757	32.27437, - 94.58828	32.28368, - 94.59431
Distance from SO_2 Source[2]	2,059 m	2,389 m	3,550 m
Wind Direction	SSW to SE	SSW to SE	SSW to SE
Grade	<1%	>2%	<1%
Flood Plains	No	Yes	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	Yes; lake (S)	None
Wind Channeling	None	None	None
Downwind[2]	No (NW)	No (NW)	No (NW)
Obstructions and Height	None	None	None
Distance from Site to Obstructions	None	None	None
Road/Site Access	Yes	Yes	No
Electricity Available <18 m	Yes	No	Yes
Pros	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · High predicted SO_2 concentrations
Cons	· Not downwind · Property owner declined	· Not downwind · Unleveled ground · No power · Existing gas pipelines · Property owner declined	· Not downwind · Difficult site access · Property owner unresponsive
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Martin Lake #28	Martin Lake #29
Location[2]	32.25960, -94.59063	32.264311, -94.53917
Distance from SO_2 Source[2]	1,973 m	3,124 m
Wind Direction	SSW to SE	SSW to SE
Grade	NA	<1%
Flood Plains	NA	No
Mountain/Valley Winds	None	None
Water Body Within 1,000 m	Yes; lake (S)	Yes (W)
Wind Channeling	None	None
Downwind[2]	No (W)	No (E)
Obstructions and Height	None	Trees (20-30 m)
Distance from Site to Obstructions	None	Tree (27 m NE), tree (32 m SE), tree (27 m NW)
Road/Site Access	Yes	Yes
Electricity Available <18 m	Yes	No
Pros	· Power available · Site access	· Level ground · Space available · Site access
Cons	· Not downwind · Property owner declined	· Not downwind · No power, property owner not contacted · Local obstructions
Viable Site (Yes, No, or Preferred)	No	No

[1]Based on 40 Code of Federal Regulations Part 58 and SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document
[2]Based on Google Earth
E – east
m – meter
N – north
NE – northeast
NNE – north-northeast
ENE – east-northeast
NNW – north-northwest
NW – northwest
S – south
SE – southeast
SO_2 – sulfur dioxide
SW – southwest
SSW – south-southwest
W – west
> – greater than
< – less than
– number
% – percent

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

References

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Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Monticello Steam Electric Station

Source Information

- Name: Monticello Steam Electric Station (Monticello) (Figure 20)
- Owner: Luminant Generation Company, LLC
- Facility function: electric generation
- Location: 33.09132, -95.03759, TCEQ Region 5, Titus County, Texas
- SO_2 emissions data: 24,396 tons (2013), 20,515 tons (2014), 18,399 tons (2015)
- Long-term emissions trend: decreasing, 63% decrease from 2010 to 2014
- Emission profile: operational seasonally (from May–September, annually), permitted to operate year-round
- Stack height(s): three stacks, S-1 and S-2 – 122 m high, S-3 – 140 m high, each currently active
- SO_2 emission controls: limestone wet-scrubbing
- Permit related data: Federal Operating Permit number 064

Existing Air Monitoring Sites

The TCEQ operates five ambient air monitoring sites within a 100 km radius of Monticello. Table 5 details these monitoring sites in order of proximity. While many factors affect where maximum SO_2 ground level concentrations would be expected to occur, generally they are expected to occur closer to the emission source. Although one location currently monitors SO_2, none of the existing sites are within a reasonable proximity to the source to characterize expected maximum SO_2 ground level concentrations.

Table 5: Air Monitoring Sites Near Monticello

Site	Distance from Monticello	Current Sulfur Dioxide (SO_2) Monitoring	SO_2 Design Value (2013–2015)
Tyler Airport Relocated	90 km southwest	No	Not applicable
Karnack	94 km southeast	No	Not applicable
Texarkana	97 km northeast	No	Not applicable
Longview	100 km southeast	Yes	46 parts per billion
Greenville	100 km west	No	Not Applicable

km – kilometer

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Settings and Surroundings

The primarily rural area surrounding Monticello is located in the eastern most portion of the Floodplains and Low Terraces ecoregions of the East Central Texas Plains. This area is characterized by a mix of dense hardwood forests of oak, ash, pecan, and cedar elm, as well as cleared pastures (Griffith et al. 2004). The elevation ranges from 91 m to 142 m, as shown in Figure 19. No significant changes to the landscape were noted during the reconnaissance as compared to the satellite image shown in Figure 24. Thick elevated vegetation is a factor that may affect wind patterns across the East Central Texas Plains area. Mountain and valley wind channeling, and other terrain related meteorological impacts, are not expected in the area surrounding Monticello.

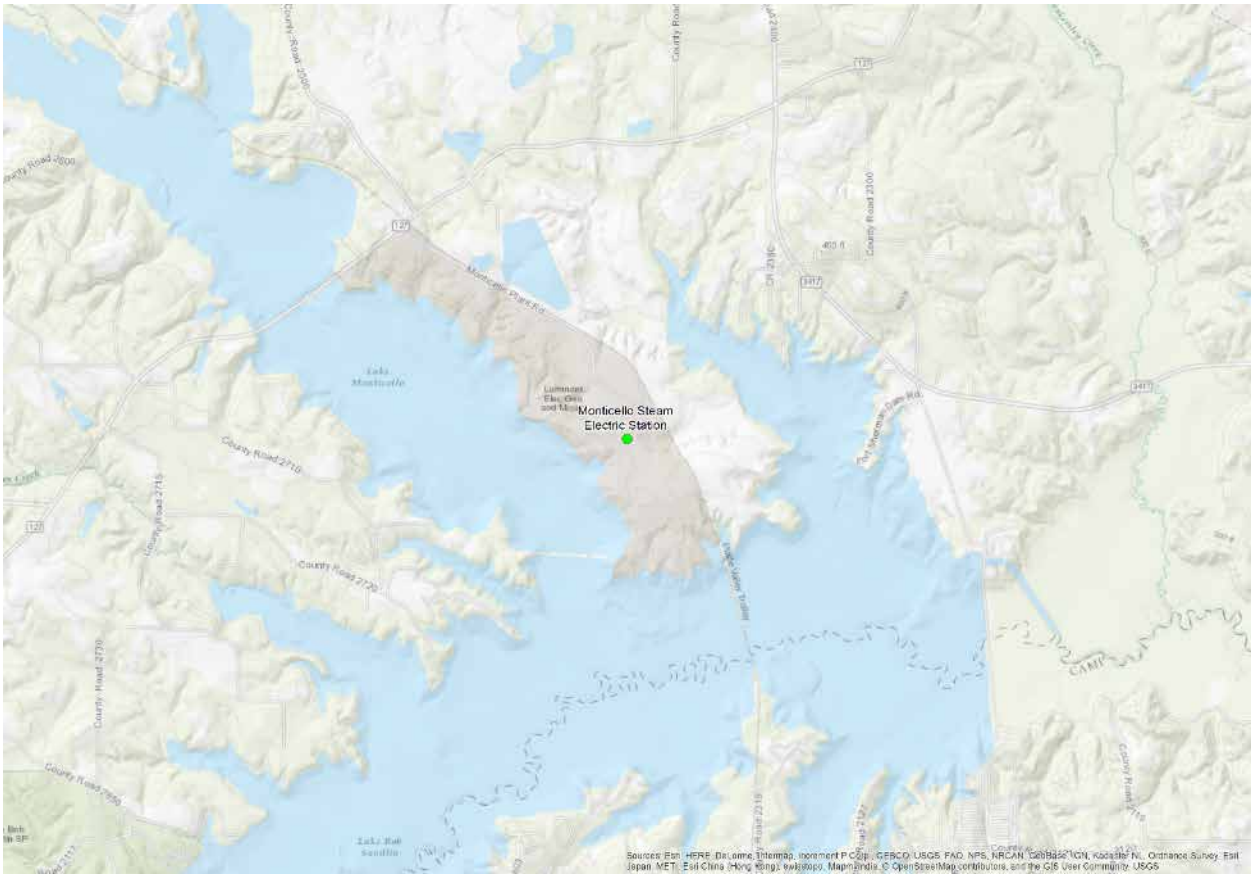


Figure 19: Monticello Area Elevation Map

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

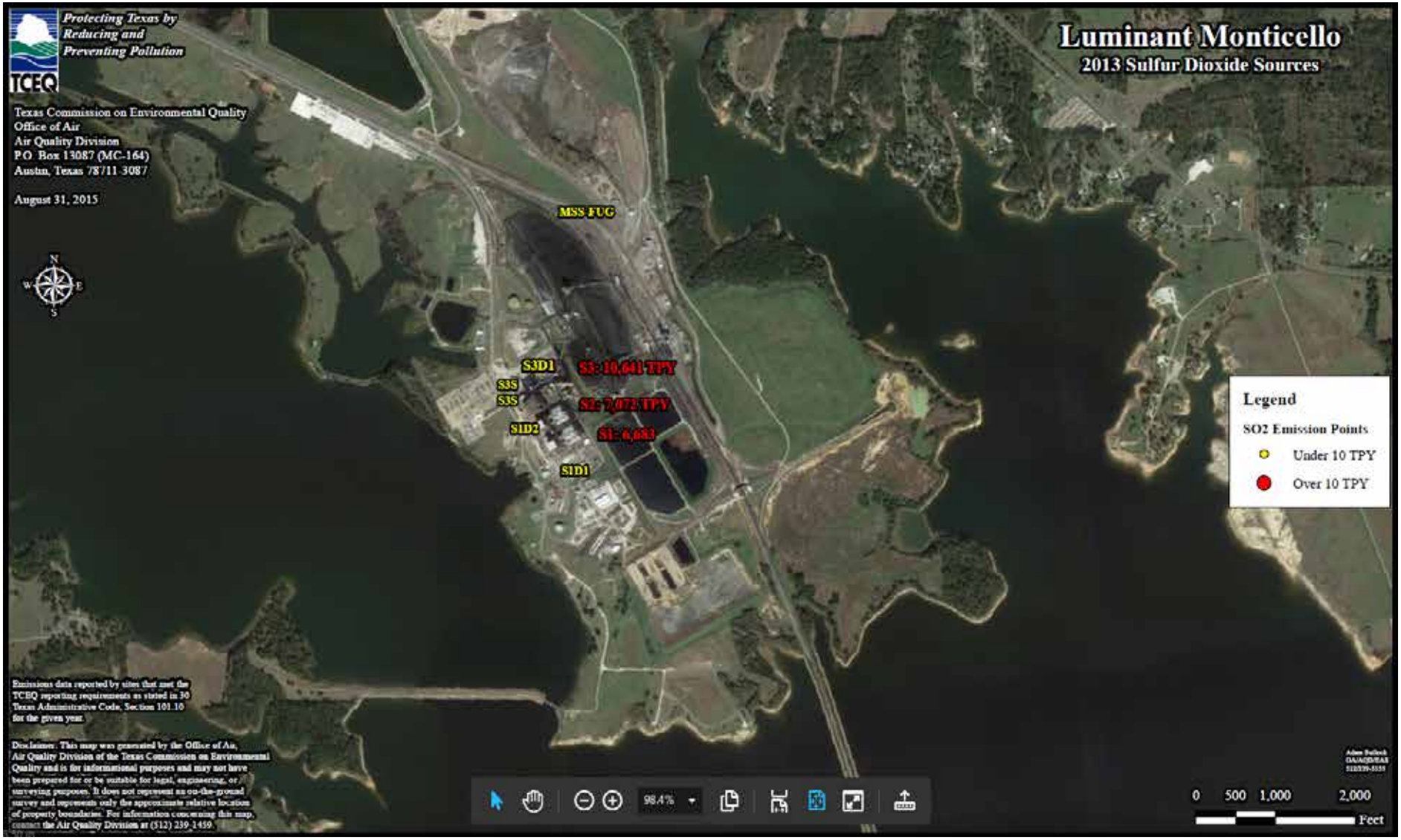


Figure 20: Monticello Sulfur Dioxide (SO_2) Stacks and Emissions, 2013

TPY – tons per year

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Meteorological Data

Figure 21 provides illustrations of local area annual average wind speed and direction for 2012, 2013, and 2014 from meteorological sensors at the Mount Pleasant Airport, located 7 km east of Monticello. Figure 22 illustrates the 2012-2014 annual average wind speed. The length of each wind rose bar corresponds to the frequency of the wind coming from the indicated direction by percentage. Based on the analysis of the 2012-2014 wind data, the dominant wind flow direction for the area is 105 degrees southeast to 190 degrees south. Approximately 32% of the average area wind flows move from these directions. Over this three-year period, calm winds (0-2 mph) occurred on average 27% of the time, and wind speeds averaged 5.8 mph (Iowa Environmental Mesonet 2016).

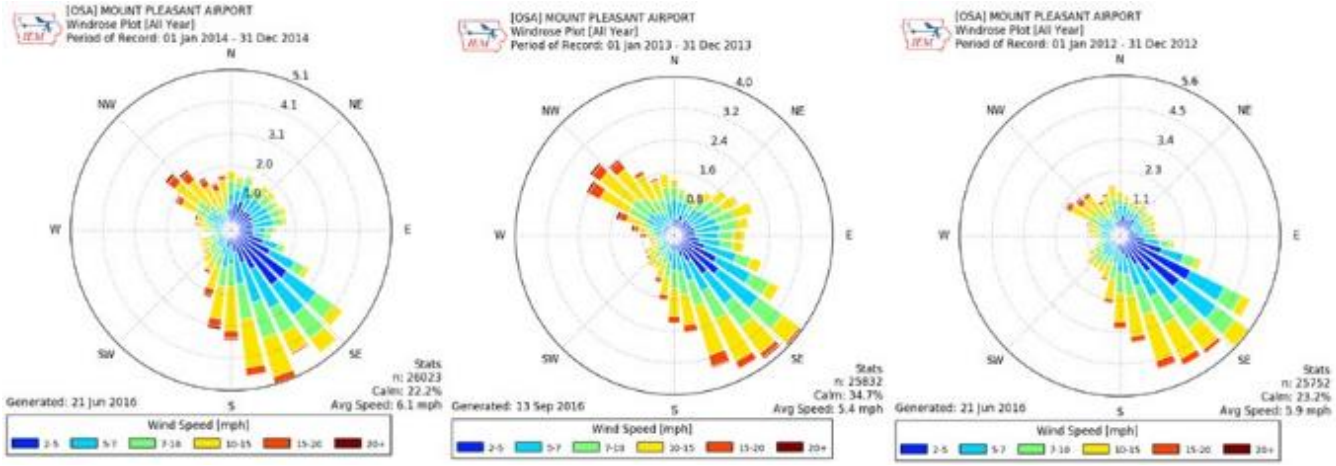


Figure 21: (From right to left) 2012, 2013, and 2014 Individual Wind Rose Plots

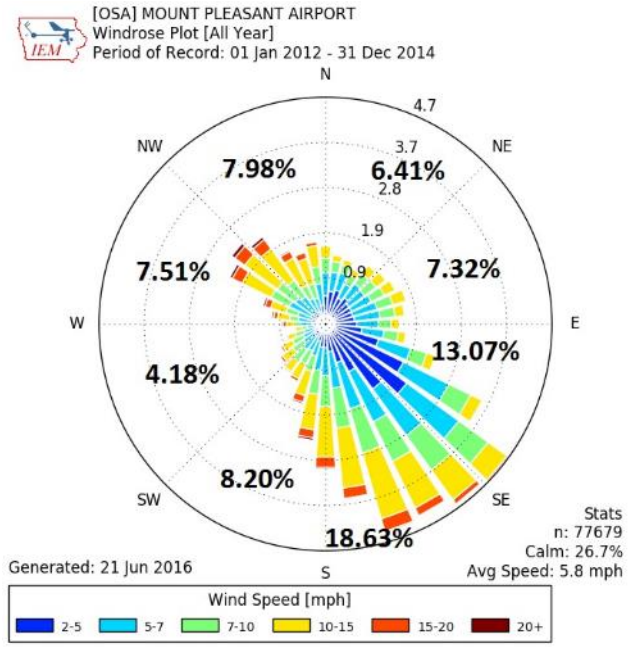


Figure 22: 2012-2014 Combined Average Wind Rose Plot

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Modeling Analysis for Monitoring Site Placement

The Monitoring TAD suggests that modeling is one technique that may be used to assist in identifying potential monitoring sites. The Modeling TAD notes that for area designations under the 2010 SO_2 NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified.

In developing area designations for the 2010 SO_2 NAAQS, the AERMOD modeling analysis provided by the Sierra Club in March 2016, was cited in the *Final Technical Support Document for the Designation Recommendations for the 2010 Sulfur Dioxide National Ambient Air Quality Standards (NAAQS) – Supplement for Four Areas in Texas Not Addressed in June 30, 2016, Version* (EPA docket identification number, EPA-HQ-OAR-2014-0464-0434) as relevant information considered by the EPA in the Monticello designation decision. Given the EPA's reliance on the 2016 Sierra Club modeling for designation purposes, the TCEQ has used this modeling as one of the tools to inform possible SO_2 monitor placement recommendations near Monticello. The use of the 2016 Sierra Club modeling analysis for possible monitor placement decisions does not infer the TCEQ's concurrence with the use of this modeling analysis for any other purpose. Figure 23 illustrates the Sierra Club's modeled impacts for the 2013-2015 actual facility emissions. In this figure, the locations that are viable for a TCEQ air monitoring site are identified with green pins and non-viable sites are identified with red pins.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Figure 23: Sierra Club's Modeled Impacts Using Actual Emissions From 2013-2015 for the Monticello Area

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Siting Options and Criteria

In 2016, the EPA designated the area surrounding Monticello as nonattainment. As a result, the TCEQ intends to site an ambient air monitor in the area to characterize SO_2 concentrations near the source. Presently, the TCEQ does not have SO_2 monitors located in the area surrounding the source. In reviewing potential monitoring sites, the TCEQ focused on complying with the federal requirements listed in 40 CFR Part 58, Appendix E, regarding siting criteria. In addition, the TCEQ evaluated areas for a monitoring site location that would sufficiently characterize air quality around an SO_2 emissions source. This approach included utilizing multiple techniques and guidance provided in the Monitoring TAD, such as modeling, local wind roses that reflect data from 2012-2014, and area site reconnaissance.

The TCEQ evaluated meteorological data, modeling data, and areas in a reasonable proximity to the source to determine potential locations for an SO_2 monitor. Meteorological data (see Figures 21, 22 and 25) indicate winds predominate with a strong southeasterly component. Easterly winds alone occurred approximately 20% of the time and were consistently 2 to 15 mph. This meteorological assessment indicated that reconnaissance to the north and northwest of Monticello should be a priority (since the prominent southeasterly wind directions would result in emissions from Monticello more frequently being dispersed north and northwest of the facility), but potential sites to the west, northeast, and east were also investigated.

The modeling analysis results provided in Figure 23 suggest that predicted off-property maximum SO_2 concentrations (i.e., average one-hour SO_2 concentrations greater than 196 µg/m^3) are expected to occur west[3] of Monticello. Further, the predicted highest modeled SO_2 concentrations based on source actual emissions are also expected to occur to the west of Monticello, with predicted concentrations above 210 µg/m^3.

After evaluating both the meteorological and modeling data, the TCEQ identified four primary areas of interest for an air monitoring site location: to the north, northeast, west, and northwest of Monticello.

Despite favorable meteorological and modeling data, some of these areas were excluded for various reasons. The predicted highest modeled concentrations expected west of the facility are located in heavily-forested areas, lacking power and public road accessibility (see purple outlined area in Figures 26 and 27) and are on the private property of adverse property owners (see yellow outlined area in Figures 26 and 27). The accessible public roads in the modeled area are lined with tall trees and dense vegetation, making these areas unsuitable for siting a monitor. These areas do not meet siting criteria and lack the electrical resources necessary for an ambient air monitoring station; thus, they were excluded from monitor siting.

The TCEQ identified 16 potential monitoring sites in the general vicinity, in areas not preliminarily excluded. Figures 23-25 depict the potential site locations (red and green pins). For each of the potential sites, the TCEQ researched the property owners on the County Appraisal District website, obtaining all available contact information (including mailing addresses, phone numbers, and email addresses). Multiple attempts to contact each property owner were made via phone calls and messages, email, and

[3] Cardinal directions are determined in relation to the Monticello facility's SO_2 stacks.

mailed correspondence. Sites where the property owners declined monitor placement or were unresponsive to phone calls, mailings, or emails are deemed not viable. Of the 16 monitoring site options, 12 sites are not viable and are indicated by red pins (see Figures 23-27). Four viable monitoring sites (sites 1, 2, 6, and 8) were identified. Table 6 details each potential monitoring site's viability.

Using meteorological analyses, the TCEQ identified several potential monitoring sites downwind of the facility to the north and northwest based on predominant wind direction, indicated by the corresponding pin numbers: 1, 3, 9, 10, 11 and 12. Only one of these sites (Site 1) is a viable option for monitor placement. Site 1 is located 2.5 km to the north of Monticello. This site is downwind of the source when winds are from the south, 27% of the year on average (see Figures 22 and 25). The site is easily accessible and offers level ground, adequate space, and available power. The property owner has signed a site agreement. The rest of the sites identified using meteorological data are not viable locations for monitor siting. The area's extensive forest contains dense vegetation and trees of a sufficient height and leaf canopy density that would interfere with the normal airflow necessary to meet air monitoring station siting criteria. The few areas that would meet siting criteria, with power, are on private property, and property owners have denied access or have been unresponsive to site agreement requests. There is also limited public access to the areas of interest.

Analyzing the modeling data, the TCEQ identified several potential monitoring sites within areas of predicted high SO_2 concentrations, indicated by the corresponding pin numbers: 13, 14, and 15. Most of the sites identified using the modeling data are not viable locations for monitor siting. The few areas that would meet siting criteria, with power, are on private property, and property owners have denied access or have been unresponsive to site agreement requests (see Figures 26 and 27). There is also limited public access to the areas of interest.

In locating sites in close proximity to Monticello, the TCEQ identified sites 2, 4, 5, 6, 7, 8, and 16. These sites neither correspond directly with meteorological data nor with modeling data, but are in close proximity to the facility. Three of these sites (sites 2, 6, and 8) are viable options for monitor placement.

- Site 2 is positioned 2.9 km to the north-northeast of Monticello. This site is downwind of the source when winds are from the southwest, 14% of the year on average (see Figure 22). The site offers level ground, adequate space, and is easily accessible.
- Site 6 is positioned 3.2 km to the north-northeast of Monticello. This site is downwind of the source when winds are from the southwest, 14% of the year on average (see Figure 22). The site offers level ground, adequate space, available power, and is easily accessible.
- Site 8 is positioned 2.4 km to the southwest of Monticello. This site is downwind of the source when winds are from the east, 20% of the year on average (see Figure 22) and is located slightly east of the predicted highest modeled SO_2 concentrations areas shown in Figures 23 and 27. The site offers level ground, adequate space, available power, and is easily accessible. The property owner is amenable to a site agreement.

The remaining sites identified based on proximity to the facility are not suitable locations for monitor placement due to lack of power, local obstructions, and adverse property owners.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Although all four viable sites are outside the area of predicted modeled concentrations, Site 1 is the most favorable site based on meteorological data. Site 1 is located approximately 2.5 km north of the Monticello facility. This site is downwind of the source when winds are from the south, approximately 27% of the year on average (see Figure 25). The site offers adequate space, available power, is close to the facility, and is easily accessible on public roads. The property owner has signed a site agreement. Although there are trees around the site, there is sufficient distance to meet and maintain siting criteria. Due to the small geographic area of predicted high modeled concentrations, one monitor should sufficiently characterize the area. Site 1 is expected to sufficiently characterize area SO_2 concentrations based on the proximity to the facility and meteorological data.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Figure 24: Potential Monitoring Sites for the Monticello Area

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

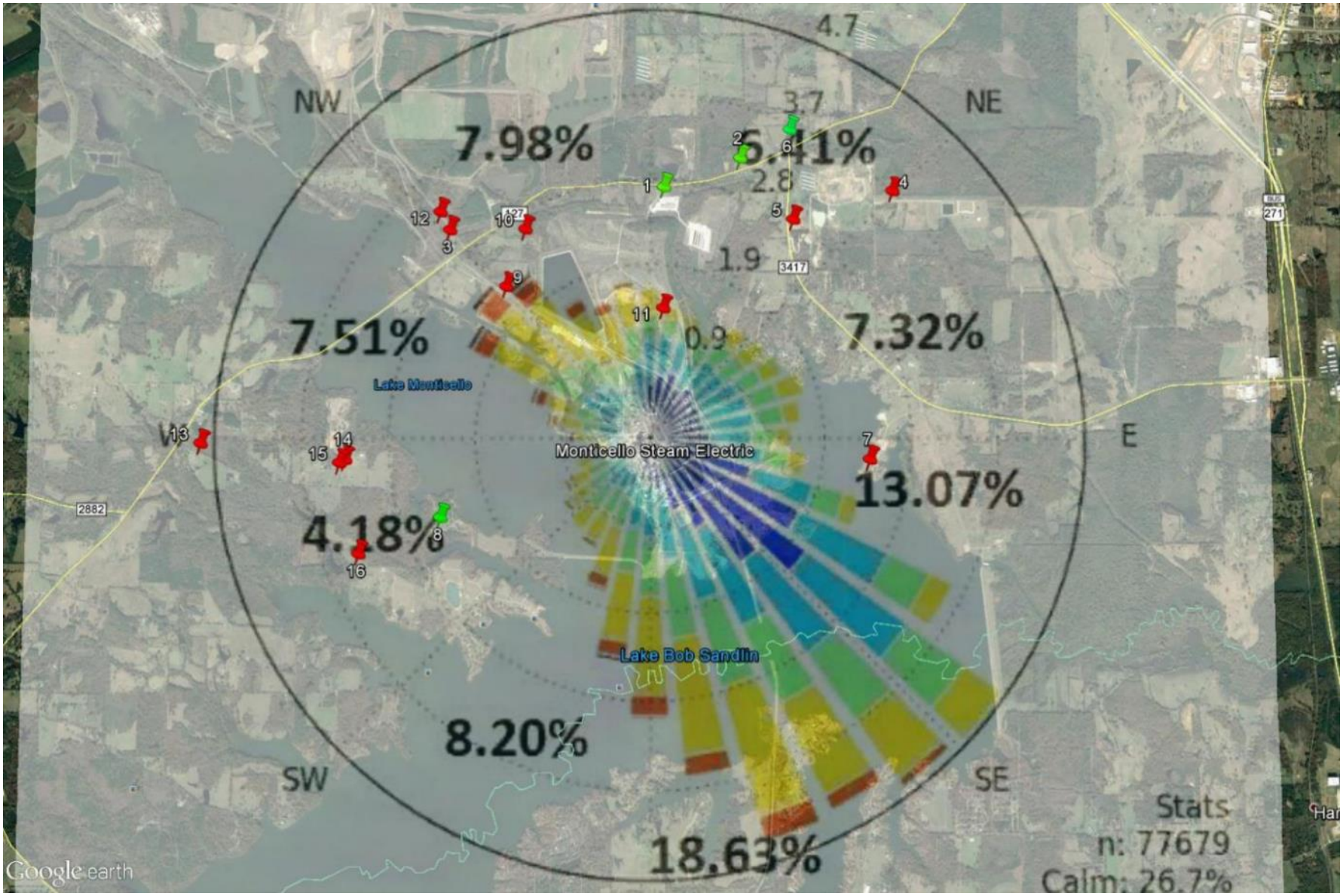
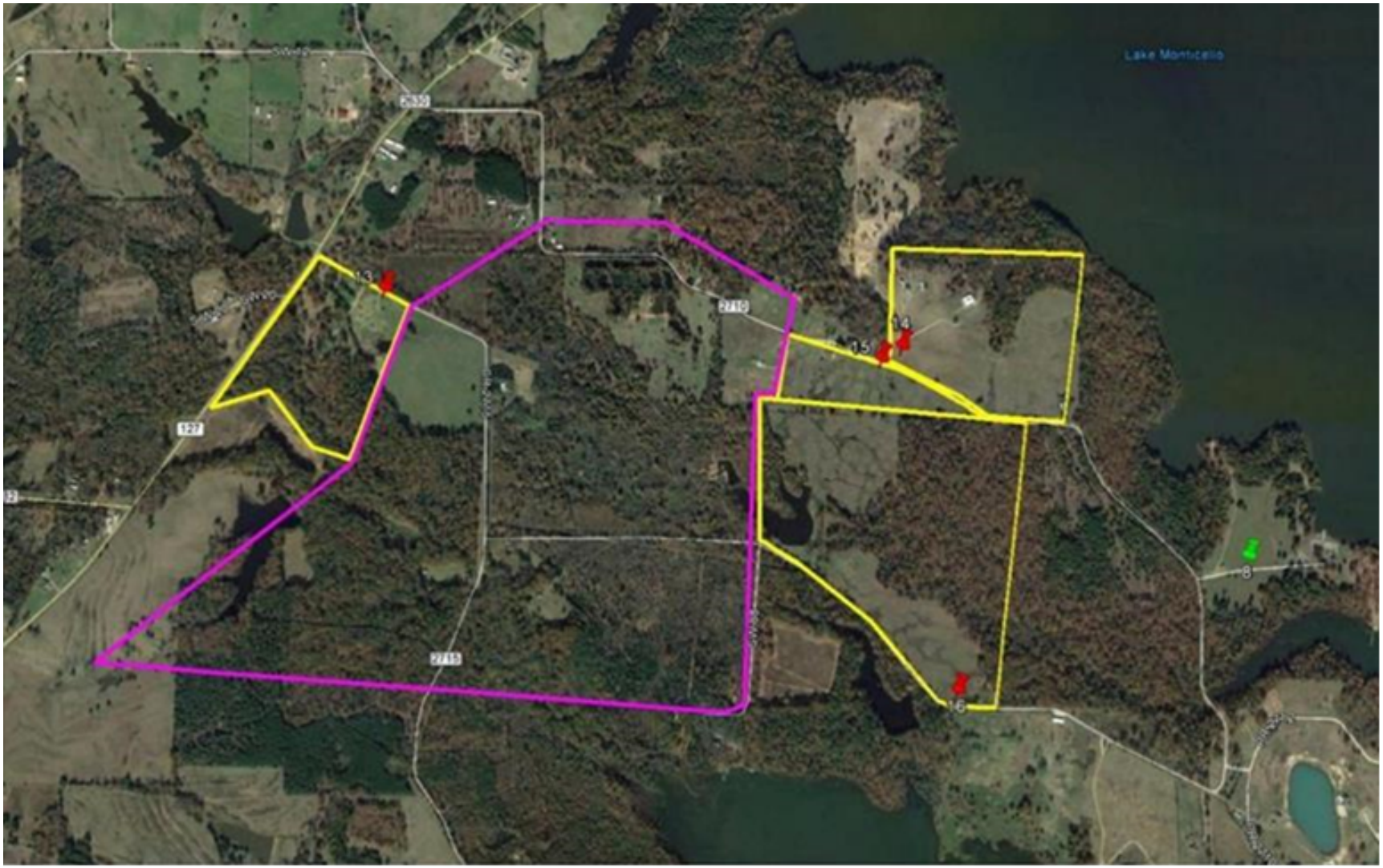


Figure 25: 2012-2014 Wind Rose Overlay for the Monticello Area

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations



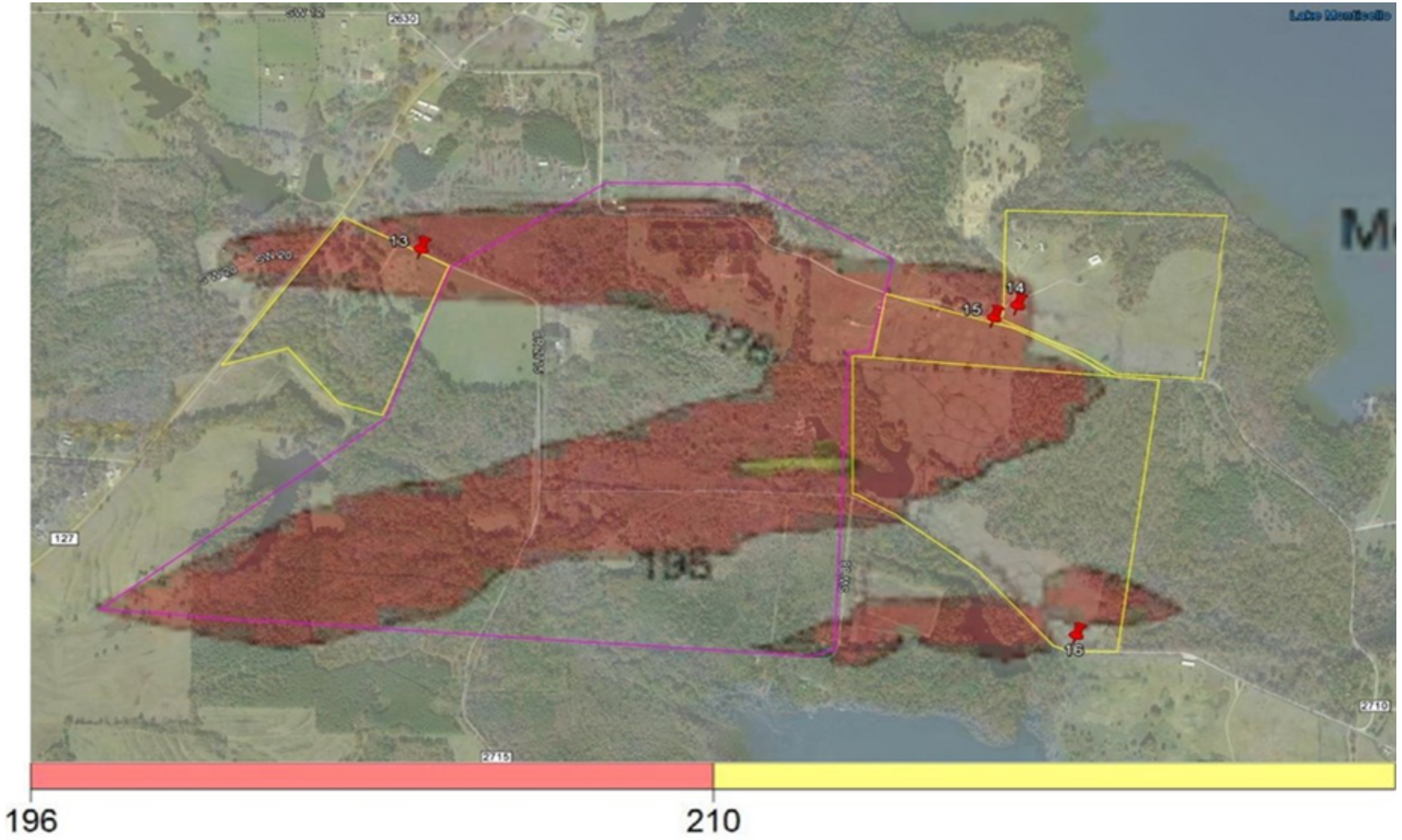
Scale

(purple line) – Properties located within the purple line indicates heavily forested areas lacking power and public road accessibility.

(yellow line) – Properties located within the yellow line represent property owners who have decined monitor placement or were unresponsive to monitor placement requests.

Figure 26: Non-Viable Areas Near Monticello

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations



Scale

(red) – 196–210 micrograms per cubic meter (µg/m³) predicted sulfur dioxide (SO_2) concentrations
(yellow) – greater than 210 µg/m³ predicted SO_2 concentrations
(purple line) – Properties located within the purple line indicates heavily forested areas lacking power and public road accessibility.
(yellow line) – Properties located within the yellow line represent property owners who have declined monitor placement or were unresponsive to monitor placement requests.

Figure 27: Non-Viable Areas Near Monticello With Predicted Modeled SO_2 Concentrations

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Summary

Logistics (e.g., electricity, vegetation, property access, and siting criteria) and adverse property owners were the most influential factors constraining site placement for the Monticello area. Necessary siting logistics and property owner amenability are lacking in areas where modeling predicted the highest SO_2 concentrations (west of the facility).

Based on current facility operations, available emissions data, logistics, and meteorological data, Site 1 is the intended location for placement of a new source-oriented ambient SO_2 monitoring station. Historical meteorological data indicate that the area around Site 1 is downwind of Monticello during southerly winds on average 27% of the year.

Pursuant to 40 CFR Sections 51.1201 and 51.1203, the TCEQ will site an air monitoring station near Monticello at Site 1 to collect air quality data for characterizing potential maximum one-hour ambient SO_2 concentrations near the Monticello Steam Electric Station.

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Table 6: Potential Sites Assessment[1]

Site Number	Monticello #1	Monticello #2	Monticello #3
Location[2]	33.11425, -95.03701	33.11688, -95.02874	33.11030, -95.06006
Distance from SO_2 Source[2]	2,544 m	2,952 m	2,970 m
Wind Direction	S, SE	S, SE	S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	None	Yes; lake (W, SW, S)
Wind Channeling	None	None	None
Downwind[2]	Yes (N)	No (NNE)	Yes (NW)
Obstructions and Height	Trees (30 m), Structure (9 m)	Trees (7 m)	Bush (3 m), Trailer (3 m)
Distance from Site to Obstructions	Trees (258 m S) Structure (42 m S)	Trees (65 m N, 64 m NE, 21 m E, 33 m S, 28 m W)	Bush (20 m N) Trailer (15 m W)
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	Yes	Yes	Yes
Pros	· Downwind · Level ground · Power available · Space available · Site access · Close proximity to facility · Agreeable property owner	· Level ground · Power available · Space available · Site access · Agreeable property owner	· Downwind · Level ground · Power available · Space available · Site access · Close proximity to facility
Cons	· Local obstructions	· Not downwind · Local obstructions	· Property owner declined · Local obstructions
Viable Site (Yes, No, or Preferred)	Preferred	Yes	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Monticello #4	Monticello #5	Monticello #6
Location[2]	33.11387, -95.01232	33.11128, -95.02306	33.11950, -95.02337
Distance from SO_2 Source[2]	3,520 m	2,640 m	3,440 m
Wind Direction	S, SE	S, SE	S, SE
Grade	>2%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	None	None	None
Wind Channeling	None	None	None
Downwind[2]	No (NE)	No (NNE)	No (NNE)
Obstructions and Height	Trees (10 m)	Trees (6 m)	Fence (1 m)
Distance from Site to Obstructions	Trees (32 m N, 61 m SE)	Trees (15 m SE)	Fence (1 m SE, SW)
Road/Site Access	Yes	No	Yes
Electricity Available <18 m	Yes	Yes	Yes
Pros	· Power available · Space available · Site access	· Level ground · Power available	· Level ground · Power available · Space available · Site access · Agreeable property owner
Cons	· Not downwind · Unleveled ground · Water main under property · Property owner declined · Local obstructions	· Not downwind · No space available · Heavy industry · No site access · Property owner declined · Local obstructions	· Not downwind · Local obstructions
Viable Site (Yes, No, or Preferred)	No	No	Yes

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Monticello #7	Monticello #8	Monticello #9
Location[2]	33.08961, -95.01497	33.08441, -95.06082	33.10517, -95.05396
Distance from SO_2 Source[2]	2,121 m	2,297 m	2,168 m
Wind Direction	S, SE	S, SE	S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (N, E, S, W)	Yes; lake (N, E, SE)	Yes; lake (SW)
Wind Channeling	None	None	None
Downwind[2]	No (E)	No (WSW)	Yes (NW)
Obstructions and Height	None	Trees (12 m)	None
Distance from Site to Obstructions	None	Trees (70 m SE, 81 m S)	None
Road/Site Access	Yes	Yes	No
Electricity Available <18 m	No	Yes	Yes
Pros	· Level ground · Space available · Site access · Close proximity to facility	· Level ground · Power available · Space available · Site access · Agreeable property owner	· Downwind · Level ground · Power available · Space available
Cons	· Not downwind · Power available at a considerable distance · Property owner declined	· Not downwind · Local obstructions	· No site access · Property owner declined
Viable Site (Yes, No, or Preferred)	No	Yes	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Monticello #10	Monticello #11	Monticello #12
Location[2]	33.11039, -95.05194	33.10321, -95.03708	33.11194, -95.06110
Distance from SO_2 Source[2]	2,505 m	1,323 m	3,171 m
Wind Direction	S, SE	S, SE	S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	Yes; lake (S)	Yes; lake (E)	Yes; lake (W)
Wind Channeling	None	None	None
Downwind[2]	Yes (NW)	Yes (N)	Yes (NW)
Obstructions and Height	Trees (12 m)	None	None
Distance from Site to Obstructions	Trees (15 m W, 13 m N, 50 m SW)	None	None
Road/Site Access	Yes	No	No
Electricity Available <18 m	Yes	No	No
Pros	· Downwind · Level ground · Power available · Site access · Close proximity to facility	· Downwind · Level ground · Space available · Close proximity to facility	· Downwind · Level ground · Close proximity to facility
Cons	· Heavily wooded area · Local obstructions · Property owner declined	· No power · No site access · Located on landfill site · Property owner declined	· No power · No site access · Heavily wooded area · Property owner declined
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Monticello #13	Monticello #14	Monticello #15
Location[2]	33.09106, - 95.08651	33.08950, - 95.07091	33.08926, - 95.07154
Distance from SO_2 Source[2]	4,569 m	3,090 m	3,107 m
Wind Direction	S, SE	S, SE	S, SE
Grade	<1%	<1%	<1%
Flood Plains	No	No	No
Mountain/Valley Winds	None	None	None
Water Body Within 1,000 m	None	Yes; lake (N)	Yes; lake (N)
Wind Channeling	None	None	None
Downwind[2]	No (W)	No (W)	No (W)
Obstructions and Height	None	None	None
Distance from Site to Obstructions	None	None	None
Road/Site Access	Yes	Yes	Yes
Electricity Available <18 m	Yes	Yes	Yes
Pros	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations	· Level ground · Power available · Space available · Site access · High predicted SO_2 concentrations
Cons	· Not downwind · Property owner unresponsive	· Not downwind · Property owner unresponsive	· Not downwind · Property owner unresponsive
Viable Site (Yes, No, or Preferred)	No	No	No

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

Site Number	Monticello #16
Location[2]	33.08116, -95.06948
Distance from SO_2 Source[2]	3,169 m
Wind Direction	S, SE
Grade	<1%
Flood Plains	No
Mountain/Valley Winds	None
Water Body Within 1,000 m	Yes; Lake (NE)
Wind Channeling	None
Downwind[2]	No (WSW)
Obstructions and Height	None
Distance from Site to Obstructions	None
Road/Site Access	Yes
Electricity Available <18 m	Yes
Pros	· Level ground · Power available · Space available · Site access
Cons	· Not downwind · Property owner unresponsive
Viable Site (Yes, No, or Preferred)	No

Based on 40 Code of Federal Regulations Part 58 and *SO_2 NAAQS Designations Source-Oriented Monitoring* Technical Assistance Document
[2]Based on Google Earth
E – east
m – meter
N – north
NA – not applicable
NE – northeast
NNE – north northeast
NW – northwest
S – south
SE – southeast
SO_2 – sulfur dioxide
SW – southwest
W – west
> – greater than
< – less than
– number
% – percent

Appendix E: Sulfur Dioxide Data Requirements Rule Monitor Placement Evaluations

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Appendix F

Ozone Monitoring Requirements

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix F: Ozone Monitoring Requirements

Metropolitan Statistical Area	2016 Population Estimates[1]	2014-2016 8-Hour Design Value (parts per	Design Value as Percent of NAAQS[2]	Total Required SLAMS Monitors	Total Required PAMS Monitors	Total Required NCore Monitors	Total Required Monitors[3]	Total Existing Monitors[4]
Dallas-Fort Worth-Arlington	7,233,323	80	114%	3	1	1	5	19
Houston-The Woodlands-Sugar La	6,772,470	79	113%	3	1	1	5	20
San Antonio-New Braunfels	2,429,609	73	104%	2	0	0	2	3
Austin-Round Rock	2,056,405	66	94%	2	0	0	2	2
McAllen-Edinburg-Mission	849,843	55	79%	1	0	0	1	1
El Paso	841,971	71	101%	2	0	1	3	6
Corpus Christi	454,726	65	93%	2	0	0	2	2
Killeen-Temple	435,857	67	96%	2	0	0	2	2
Brownsville-Harlingen	422,135	57	81%	1	0	0	1	2
Beaumont-Port Arthur	409,968	68	97%	2	0	0	2	7
Lubbock	314,840	N/A	N/A	0	0	0	0	0
Laredo	271,193	54	77%	0	0	0	0	1
Waco	265,207	63	90%	1	0	0	1	1
Amarillo	263,342	N/A	N/A	0	0	0	0	0
College Station-Bryan	254,928	N/A	N/A	0	0	0	0	0
Tyler	225,290	65	93%	1	0	0	1	1
Longview	217,446	66	94%	1	0	0	1	1
Abilene	170,364	N/A	N/A	0	0	0	0	0
Midland	168,288	N/A	N/A	0	0	0	0	0
Odessa	157,462	N/A	N/A	0	0	0	0	0
Wichita Falls	150,734	N/A	N/A	0	0	0	0	0
Texarkana	150,098	N/A	N/A	0	0	0	0	0
Sherman-Denison	128,235	N/A	N/A	0	0	0	0	0
San Angelo	119,943	N/A	N/A	0	0	0	0	0
Victoria	99,984	65	93%	1	0	0	1	1
Marshall*	66,534	62	89%	0	0	0	0	1
Totals	**N/A**	**N/A**	**N/A**	**24**	**2**	**3**	**29**	**70**

[1]United States Census Bureau population estimates as of July 1, 2016

[2]2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS) is .070 parts per million

[3]Total Required Monitors is a count of individual requirements for SLAMS, PAMS, and NCore.

[4]Individual monitors may fulfill more than one monitoring requirement.

*Classified as Micropolitan Statistical Area and does not apply to SLAMS requirements

N/A - not applicable

PAMS - Photochemical Assessment Monitoring Stations

SLAMS - State or Local Air Monitoring Stations

NCore - National Core Multipollutant Monitoring Stations

Appendix G

Carbon Monoxide Monitoring Requirements

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix G: Carbon Monoxide Monitoring Requirements

Core Based Statistical Areas	2016 Population Estimates[1]	Required CO Near-Road Monitors	Required CO NCore Monitors[2]	Total Required Monitors	Total Current Monitors[3]
Dallas-Fort Worth-Arlington	7,233,323	Fort Worth California Parkway	Dallas Hinton	2	2
Houston-The Woodlands-Sugar Land	6,772,470	Houston North Loop	Houston Deer Park #2	2	3
San Antonio-New Braunfels	2,429,609	San Antonio Interstate 35	N/A	1	1
Austin-Round Rock	2,056,405	Austin North Interstate 35	N/A	1	1
McAllen-Edinburg-Mission	849,843	N/A	N/A	0	0
El Paso	841,971	N/A	El Paso Chamizal	1	3
Corpus Christi	454,726	N/A	N/A	0	0
Killeen-Temple	435,857	N/A	N/A	0	0
Brownsville-Harlingen	422,135	N/A	N/A	0	1
Beaumont-Port Arthur	409,968	N/A	N/A	0	1
Lubbock	314,840	N/A	N/A	0	0
Laredo	271,193	N/A	N/A	0	2
Waco	265,207	N/A	N/A	0	1
Amarillo	263,342	N/A	N/A	0	0
College Station-Bryan	254,928	N/A	N/A	0	0
Tyler	225,290	N/A	N/A	0	0
Longview	217,446	N/A	N/A	0	0
Abilene	170,364	N/A	N/A	0	0
Midland	168,288	N/A	N/A	0	0
Odessa	157,462	N/A	N/A	0	0
Wichita Falls	150,734	N/A	N/A	0	0
Texarkana	150,098	N/A	N/A	0	0
Sherman-Denison	128,235	N/A	N/A	0	0
San Angelo	119,943	N/A	N/A	0	0
Victoria	99,984	N/A	N/A	0	0
Total		**4**	**3**	**7**	**15**

[1]United States Census Bureau population estimates as of July 1, 2016

[2]High sensitivity CO monitors are recommended at NCore sites

[3]Monitors may fulfill multiple monitoring requirements, but are only counted once in the total monitor counts.

CO - carbon monoxide

NCore - National Core Multipollutant Monitoring Stations

N/A - not applicable

Appendix H

Particulate Matter of 10 Micrometers or Less Monitoring Requirements, Monitor Locations, and Method Codes

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix H: Particulate Matter of 10 Micrometers or Less Monitoring Requirements, Monitor Locations, and Method Codes

Table 1: Particulate Matter of 10 Micrometers or Less Monitoring Requirements and Monitor Locations

Metropolitan Statistical Area	2016 Population Estimates*	Site Name	2014-2016 Maximum Concentration (µg/m^3)	Percent of NAAQS**	Required Monitors***	Existing Monitors
Dallas-Fort Worth-Arlington	7,233,323				4-8	4
		Earhart	132	88		
		Convention Center (collocated pair)	93	62		
		Dallas North #2	74	49		
		Stage Coach	72	48		
Houston-The Woodlands-Sugar Land	6,772,470				4-8	7
		Clinton (collocated pair)	130	87		
		Houston Monroe	99	66		
		Houston Westhollow	95	63		
		Lang	94	63		
		Texas City Fire Station (collocated pair)	92	61		
		Houston Deer Park #2 (collocated pair)	91	61		
		Houston Aldine	89	59		
San Antonio-New Braunfels	2,429,609				2-4	2
		Selma	78	52		
		Frank Wing Municipal Court	77	51		
Austin-Round Rock	2,056,405				2-4	2
		Austin Webberville Rd	99	66		
		Austin Audubon Society	76	51		
El Paso	841,971				2-4	5
		Socorro Hueco (collocated pair)	130	87		
		Riverside	87	58		
		Ojo De Agua (collocated pair)	91	61		
		Van Buren	81	54		
		Ivanhoe	87	58		
McAllen-Edinburg-Mission	849,843				1-2	2
		Mission	79	53		
		Edinburg East Freddy Gonzalez Drive	74	49		
Corpus Christi	454,726				0-1	1
		Dona Park	83	55		
Laredo	271,193				0-1	2
		Laredo Vidaurri	65	43		
		Laredo Bridge	56	37		
Marshall (Micropolitan Statistical Area)	66,534				0	1
		Karnack	66	44		
Killeen-Temple	435,857			0	0-1	0
Brownsville-Harlingen	422,135			0	0-1	0
Beaumont-Port Arthur	409,968			0	0-1	0
Lubbock	314,840			0	0-1	0
Amarillo	263,342			0	0-1	0
College Station-Bryan	254,928			0	0-1	0
Waco	265,207			0	0-1	0
Totals					**15 - 38**	**26**

This list does not include Metropolitan Statistical Areas with zero requirements and zero monitors.

*United States Census Bureau population estimates as of July 1, 2016

**Current PM_{10} NAAQS is 150 µg/m^3

***Required monitor count is based on population, percent of NAAQS, and maximum concentration

NAAQS - National Ambient Air Quality Standards

µg/m^3 - micrograms per cubic meter

PM_{10} - particulate matter of 10 micrometers or less

Appendix H: Particulate Matter of 10 Micrometers or Less Monitoring Requirements, Monitor Locations, and Method Codes

Table 2: Particulate Matter of 10 Micrometers or Less Monitor and Method Codes

AQS Number	Site Name	Method Code	2014-2016 Maximum Concentration (µg/m³)	2016 Annual Mean Concentration (µg/m³)	2015 Annual Mean Concentration (µg/m³)[2]	2014 Annual Mean Concentration (µg/m³)
482011035	Clinton (collocated pair)	64	130	32.2*	44.4*	42.4*
481410038	Riverside	62	87	32.2*	22.8	25.8*
482150043	Mission	141	79	29.5*	26.3*	27.0*
481410057	Socorro Hueco (collocated pair)	62	130	29.0*	24.5*	31.6*
482151046	Edinburg East Freddy Gonzalez Drive	141	74	26.2*	22.2	N/A
481130050	Convention Center (collocated pair)	141	93	25.9*	24.0*	26.9*
484530021	Austin Webberville Rd	141	99	24.1*	23.6	25.7*
481411021	Ojo De Agua (collocated pair)	62	91	24.1*	23.6*	17.7
481130061	Earhart	141	132	23.4	24.1*	25.1*
481410029	Ivanhoe	62	87	22.9	18.6	19.9
482010062	Houston Monroe	64	99	22.3	25.2*	24.4
484790016	Laredo Vidaurri	62	65	21.8	19.6	23.3
482010047	Lang	64	94	21.7	25.1*	23.8
480290060	Frank Wing Municipal Court	141	77	20.8	21.9	25.1*
484790017	Laredo Bridge	62	56	20.7	19.5	19.6
483550034	Dona Park	141	83	20.4	23.3	24.4
482010024	Houston Aldine	141	89	20.0	22.9	23.6
481410693	Van Buren	62	81	19.6	14.0	19.8
480290053	Selma	141	78	19.3	18.4	22.7
482010066	Houston Westhollow	64	95	17.8	20.6	20.0
482030002	Karnack	141	66	16.8	15.3	15.4
484393010	Stage Coach	64	72	16.6	17.2	19.7
481130075	Dallas North #2	141	74	16.5	18.5	18.3
482011039	Houston Deer Park #2 (collocated pair)	141	91	16.4	19.5	19.4
484530020	Austin Audubon Society	141	76	15.7	16.8	18.8
481670004	Texas City Fire Station (collocated pair)	63	92	11.4	18.5	19.5

*sites having annual mean particulate matter concentration among the highest 25 percent
AQS - Air Quality System
PM_{10} - particulate matter of 10 micrometers or less
µg/m³ - micrograms per cubic meter
N/A - not applicable

Appendix I

Particulate Matter of 2.5 Micrometers or Less Monitoring Requirements, Monitor Locations, and Method Codes

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix I: Particulate Matter of 2.5 Micrometers or Less Monitoring Requirements, Monitor Locations, and Method Codes

Table 1: Particulate Matter of 2.5 Micrometers or Less Monitoring Requirements

Metropolitan Statistical Area	2016 Population Estimates[1]	2014-2016 DV (µg/m3) Annual	2014-2016 DV (µg/m3) 24-Hour	Percent of NAAQS Annual[2]	Percent of NAAQS 24-Hour[3]	FRM/FEM Samplers Required Monitors[4]	FRM/FEM Samplers Existing Monitors[5]	Speciation Required Monitors[4]	Speciation Existing Monitors[5]	Continuous Required Monitors[4]	Continuous Existing Monitors[5]	Totals Required Monitors[4]	Totals Existing Monitors[5]
Dallas-Fort Worth-Arlington	7,233,323	9.5	19	79	54	4	7	1	2	2	6	7	15
Houston-The Woodlands-Sugar Land	6,772,470	11.3	22	94	63	5	7	1	2	5	9	11	18
San Antonio-New Braunfels	2,429,609	8.4	22	70	63	3	3	0	0	2	5	5	8
Austin-Round Rock	2,056,405	9.6	19	80	54	3	2	0	0	0	3	3	5
McAllen-Edinburg-Mission[7]	849,843	10.1	25	84	71	2	2	0	0	1	1	3	3
El Paso	841,971	9.4	25	78	71	2	2	1	1	2	4	5	7
Corpus Christi	454,726	9.9	25	83	71	1	2	0	1	1	1	2	4
Killeen-Temple	435,857	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0	0
Brownsville-Harlingen[7]	422,135	10.7	25	89	71	1	1	0	0	0	1	1	2
Beaumont-Port Arthur	409,968	N/A	N/A	N/A	N/A	0	0	0	0	0	3	0	3
Lubbock	314,840	N/A	N/A	N/A	N/A	0	0	0	0	0	1	0	1
Laredo	271,193	N/A	N/A	N/A	N/A	0	0	0	0	1	1	1	1
Waco	265,207	N/A	N/A	N/A	N/A	0	0	0	0	0	1	0	1
Amarillo	263,342	N/A	N/A	N/A	N/A	0	0	0	0	0	1	0	1
Odessa	157,462	N/A	N/A	N/A	N/A	0	0	0	0	0	1	0	1
Texarkana	150,098	8.5	17	71	49	0	1	0	0	1	1	1	2
Marshall[6]	66,534	8.8	17	73	49	0	1	0	1	1	1	1	3
Eagle Pass[6]	57,685	N/A	N/A	N/A	N/A	0	0	0	0	0	1	0	1
Corsicana[6]	48,523	N/A	N/A	N/A	N/A	0	0	0	0	0	1	0	1
Big Bend National Park[8]	N/A	N/A	N/A	N/A	N/A	0	0	0	0	1	1	1	1
Fayette County[8]	N/A	N/A	N/A	N/A	N/A	0	0	0	0	1	1	1	1
Totals						**21**	**28**	**3**	**7**	**17**	**44**	**41**	**79**

[1]United States Census Bureau population estimates as of July 1, 2016

[2]Current $PM_{2.5}$ Annual NAAQS is 12 micrograms per cubic meter (µg/m^3)

[3]Current $PM_{2.5}$ 24-hour NAAQS is 35 µg/m^3

[4]Required monitors include State or Local Air Monitoring Stations (SLAMS), National Core (NCore), Near-road, Regional Background, Regional Transport and Regional Haze requirements.

[5]Individual monitors may fulfill one or more requirements.

[6]Area is classified as a micropolitan area, and is not subject to SLAMS requirements.

[7]Site annual values do not meet completeness criteria.

[8]Sites do not fall within a metropolitan or micropolitan statistical area.

µg/m3 - micrograms per cubic meter

DV - Design Value

FEM - federal equivalent method

FRM - federal reference method

N/A - not applicable

NAAQS - National Ambient Air Quality Standards

This list does not include Metropolitan Statistical Areas with no requirement and no monitors.

Appendix I: Particulate Matter of 2.5 Micrometers or Less Monitoring Requirements, Monitor Locations, and Method Codes

Table 2: Particulate Matter of 2.5 Micrometers or Less Method Codes

AQS Number	$PM_{2.5}$ FRM / FEM Site Name	Current Method Code	Method Code Updated
480290032	San Antonio Northwest	145	-
480290059	Calaveras Lake	145	-
480291069	San Antonio Interstate 35	145	-
480370004	Texarkana	145	-
480610006	Brownsville (relocating to Harlingen Teege (AQS# 480611023) in 2017)	145	209
481130050	Convention Center	145	-
481130069	Dallas Hinton (collocated pair and continuous FEM)	145, 145, 170	-
481390016	Midlothian OFW	145	-
481410037	El Paso UTEP	145	-
481410044	El Paso Chamizal (collocated pair and continuous FEM)	145, 145, 170	-
481671034	Galveston 99th Street	145	-
482010024	Houston Aldine	145	-
482010058	Baytown	145	209
482011035	Clinton (collocated pair)	145	-
482011039	Houston Deer Park #2 (and continuous FEM)	145, 170	-
482011052	Houston North Loop	145	-
482030002	Karnack	145	-
482150043	Mission	145	-
482151046	Edinburg East Freddy Gonzalez Drive	145	-
483550032	Corpus Christi Huisache (collocated pair)	145	-
483550034	Dona Park	145	-
484391002	Fort Worth Northwest	145	-
484391006	Haws Athletic Center	145	-
484391053	Fort Worth California Parkway North	145	-
484530020	Austin Audubon Society	145	-
484530021	Austin Webberville Road (collocated method 209 with method 145)	145	145, 209
484531068	Austin North Interstate 35	145	-
480430101	*Bravo Big Bend	702 (non-regulatory)	209
482450022	*Hamshire	702 (non-regulatory)	209
484790313	*World Trade Bridge	702 (non-regulatory)	209

*Not an FRM site, but method code changed in 2017

AQS - Air Quality System

FRM/FEM - federal reference method/federal equivalent method

$PM_{2.5}$ - particulate matter of 2.5 micrometers or less

Appendix J

Acronym and Abbreviation List

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix J: Acronym and Abbreviation List

– number

% – percent

> – greater than

< – less than

µg/m^3 – micrograms per cubic meter

AADT – annual average daily traffic

AERMOD – American Meteorological Society/Environmental Protection Agency Regulatory Model

AMNP – annual monitoring network plan

AQS – Air Quality System

autoGC – automated gas chromatograph

BAM – beta attenuation mass (monitor)

CBSA – core based statistical area

CFR – Code of Federal Regulations

CO – carbon monoxide

CSN – Chemical Speciation Network

DRR – Data Requirements Rule

EI – emissions inventory

EPA – Environmental Protection Agency

FEM – federal equivalent method

FRM – federal reference method

LLC – limited liability company

MSA – metropolitan statistical area

NAAQS – National Ambient Air Quality Standards

NATTS – National Air Toxics Trends Stations

NCore – National Core Multipollutant Monitoring Stations

NEI – National Emissions Inventory

NO_2 – nitrogen dioxide

NO – nitric oxide

NO_y – total reactive nitrogen compounds

O_3 – ozone

PAMS – Photochemical Assessment Monitoring Stations

Pb – lead

ppb – parts per billion

ppm – parts per million

PM_{10} – particulate matter of 10 micrometers or less in diameter

$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter

$PM_{10-2.5}$ – coarse particulate matter

PWEI – population weighted emissions index

QA – quality assurance

RA-40 – Regional Administrator 40

Rd – road

SE – southeast

SETRPC – South East Texas Regional Planning Committee

SIP – state implementation plan

SLAMS – State or Local Air Monitoring Stations

SO_2 – sulfur dioxide

SPM – special purpose monitor

STN – Speciation Trends Network

TAD – technical assistance document

TCEQ – Texas Commission on Environmental Quality

TEOM – tapered element oscillating microbalance

tpy – tons per year

TSP – total suspended particulate

U.S. – United States

UTEP – University of Texas at El Paso

UV – ultraviolet

VOC – volatile organic compound

Appendix K

Sulfur Dioxide Ongoing Data Requirements Annual Report

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix K: Sulfur Dioxide Ongoing Data Requirements

Annual Report

As required by 40 Code of Federal Regulations (CFR) Part 51.1205(b), this report provides the Texas Commission on Environmental Quality's (TCEQ) first annual assessment of sulfur dioxide (SO_2) emissions changes for areas designated unclassifiable/attainment for the 2010 SO_2 National Ambient Air Quality Standard (NAAQS), where the designations were based on modeling actual SO_2 emissions.

For the seven Texas counties currently designated unclassifiable/attainment for the 2010 SO_2 NAAQS, six were designated based on modeled actual SO_2 emissions. Table 1 provides the most recent (2015) quality assured data available showing total actual SO_2 emissions from relevant sources in each of these six counties. The table includes actual emissions from the previous year (2014) and the decrease in these SO_2 emissions from 2014 to 2015. The emissions decrease in each of these counties provides reasonable assurance that these sources continue to meet the 2010 SO_2 NAAQS based on the modeling previously conducted. The TCEQ recommends that no additional modeling is needed to characterize SO_2 air quality in any of the six Texas counties listed in Table 1.

McLennan County, Texas, was designated unclassifiable/attainment for the 2010 SO_2 NAAQS based on modeled allowable SO_2 emissions from the Sandy Creek Energy Station. Pursuant to 40 CFR 51.1205(c), this area is not subject to ongoing data requirements, and Texas is not required to report future annual SO_2 emissions assessments for McLennan County because allowable emissions were used for the modeling.

A modeling analysis of the Oklaunion Power Station location in Wilbarger County, Texas, was submitted to the United States Environmental Protection Agency (EPA) in January 2017. Wilbarger County has not yet been designated for the 2010 SO_2 NAAQS; however, the modeling based on actual 2013-2015 emissions that was submitted demonstrates all receptor values are at less than 50 percent of the NAAQS. If the EPA designates this area unclassifiable/attainment as expected, it will not be subject to ongoing data requirements, and Texas will not be required to submit any annual reports for Wilbarger County per 40 CFR 51.1205(b)(2).

Table 1: 2014 to 2015 Emission Comparison

County	Relevant Source	2014 Actual SO_2 (tpy)	2015 Actual SO_2 (tpy)	Difference 2014 to 2015
Goliad	Coleto Creek Power Station	16,934.04	8,261.1	-8,672.94
Limestone	Limestone Electric Generating Station	27,862.28	17,218.49	-10,643.79
Atascosa	San Miguel Electric Plant	6,909.49	5,520.56	-1,388.93
Lamb	Tolk Station Power Plant	16,752.94	16,080.38	-672.56
Robertson	Twin Oaks Power Station	5,761.77	4,493.91	-1,267.86
Fort Bend	W.A. Parish Electric Generating Station	43,980.80	42,689.83	-1,290.97

tpy – tons per year

Appendix L

TCEQ Response to Comments Received on the 2017 Annual Monitoring Network Plan

Texas Commission on Environmental Quality
2017 Annual Monitoring Network Plan

Appendix L: TCEQ Responses to Comments Received on the 2017 Annual Monitoring Network Plan

Introduction

As required by 40 Code of Federal Regulations (CFR) Part 58.10, the Texas Commission on Environmental Quality (TCEQ) posted the 2017 Annual Monitoring Network Plan (AMNP) for public inspection for 30 days prior to submittal to the United States (U.S.) Environmental Protection Agency (EPA). During the public comment period from May 1, 2017, to May 31, 2017, the TCEQ received three comments from seven respondents regarding the posted document. The comments included a request for additional analysis of whether ozone (O_3) monitors in the Corpus Christi area were meeting federal requirements, requests for additional ambient air monitoring in San Patricio County, and reconsideration of proposed changes for the air monitors in the Austin area.

Summary and Response

Comment 1: The Hillcrest Residents Association (HRA), a neighborhood advocacy group representing communities in the Corpus Christi airshed, expressed concern about a lack of information about five continuous air monitoring stations (CAMS) in Corpus Christi. According to the HRA, the AMNP does not provide adequate information to ascertain whether the O_3 monitors at the Corpus Christi West (CAMS 4) and Corpus Christi Tuloso (CAMS 21) sites are meeting federal siting requirements. Specifically, the HRA commented that the AMNP failed to provide an analysis on the site locations to ensure that these sites meet the following criteria:

"(1) measure peak air pollution levels in the airshed, that is, are they located downwind from ozone precursors and transport areas, where the highest ozone levels should occur;

(2) are situated to measure typical levels in populated areas, since the CAMS are not located in densely populated areas;

(3) are located to best measure transport of ozone precursors from areas expected to produce ozone in the region, for instance in areas where emissions from Houston and Eagle Ford shale production are likely to affect air quality;

(4) sufficiently measure high ozone spikes caused by to emissions of specific ozone-enhancing VOCs of local refineries."

The HRA also stated that the AMNP does not provide sufficient analysis of the ozone monitors at the Holly Road (CAMS 660), Violet (CAMS 664), and Ingleside (CAMS 685) sites for the EPA to better understand the air quality for the Corpus Christi airshed.

Response 1: The TCEQ appreciates the input from the Hillcrest Residents Association and supports the interest in air monitoring site information. The EPA defines requirements for the scope of the AMNP in 40 CFR Part 58.10. The AMNP is required to provide the implementation and maintenance framework for the TCEQ ambient air quality monitoring network; the monitoring plan presents the current Texas network along with recommended changes. Background siting analysis does not fall within the scope of the AMNP. Detailed evaluations of spatial scales, changes in population density, and other site considerations that contribute to monitoring objectives are described in the Texas Five-Year Ambient Monitoring Network Assessment, published

in 2015 and scheduled again for 2020. Currently, CAMS 4 and CAMS 21 both meet federal requirements for appropriate siting scales outlined in 40 CFR Part 58, Appendix D. The Texas Five-Year Ambient Monitoring Network Assessment is publicly available on the TCEQ webpage.

The AMNP pertains to the existing TCEQ network of federally-funded, regulatory ambient air quality monitors. The AMNP does not include an explanation of monitors that are owned and operated by local entities or operated for purposes other than complying with federal monitoring requirements. CAMS 660, 664, and 685 are owned by the City of Corpus Christi and operated by Texas A&M Kingsville. Analysis of these monitoring stations does not fall within the scope of the AMNP. Site information and real-time data for all monitoring sites hosted by the TCEQ, including CAMS 660, 664, and 685, are available through the Texas Air Monitoring Information System: http://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=report.site_list.

Comment 2: Portland Citizens United, a grassroots organization opposed to the construction of the new EXXON/SABIC petrochemical facility seeking permits to operate near Portland, Texas, and several private citizens commented on the 2017 AMNP to express concern for the lack of ambient air monitors in San Patricio County. San Patricio County is located north of Nueces Bay within the Corpus Christi urban airshed. Data provided by the commenters indicate that San Patricio County is located downwind of several industrial facilities in the area. To assist in health effects evaluations in vulnerable populations and evaluations of O3 precursor emissions, the commenters request that air monitors be located in San Patricio County to detect carbon monoxide (CO), oxides of nitrogen (NO_x), and particulate matter of 2.5 micrometers or less ($PM_{2.5}$). Commenters also noted concerns regarding the components of soot emissions found in $PM_{2.5}$ particles.

Portland Citizens United provided a summary of emissions information for CO, NO_x, $PM_{2.5}$, particulate matter of 10 micrometers or less (PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOCs) from fourteen facilities. Data provided by the commenters indicate that schools and populated neighborhoods are directly downwind from and within three miles of three of the identified facilities. Additionally, commenters expressed concern regarding exceedance of allowable emissions by specific industrial facilities in the region.

Response 2: The TCEQ appreciates the comments and will investigate the need for ambient air monitoring in San Patricio County. Portland Citizens United correctly indicated that the TCEQ currently does not monitor for CO, NO_x, or $PM_{2.5}$ in San Patricio County. The City of Corpus Christi does monitor for O_3 and collects meteorological data in Ingleside, which is in San Patricio County. The TCEQ operates five monitoring sites in the Corpus Christi area monitoring O_3, SO_2, $PM_{2.5}$ (including $PM_{2.5}$ mass and particulate speciation analysis), PM10, solar radiation, and meteorological parameters that evaluate compliance with the National Ambient Air Quality Standards (NAAQS). In addition, the TCEQ operates three, state initiative, monitoring sites in the Corpus Christi area monitoring speciated VOCs by canister and by automated gas chromatography, hydrogen sulfide, relative humidity, and meteorological parameters. The speciated VOC analyses at the special purpose state initiative sites evaluate and provide information regarding public health impacts, O_3 precursors, population exposure, and pollutant concentrations. Speciated VOC analysis measures a panel of pollutants, to evaluate source emissions and air toxics. The

majority of these monitoring sites are strategically sited downwind of significant industrial sources along the Nueces Bay and are expected to measure the highest emissions concentrations in the region.

There are no CO monitors present in the Corpus Christi region, due to a lack of federal regulatory requirements and observed need for CO monitoring. The commenter noted that the 2016 maximum allowable CO emissions for voestalpine Texas LLC, an iron making facility in San Patricio County, are 4,308.6 tons per year. The actual CO emissions reported for 2016 were 1,821.98 tons per year (2016 data are preliminary and still under review by the TCEQ). CO monitors averaged throughout the state display a one-hour average design value of 2.04 parts per million (ppm), less than 6 percent of the one-hour NAAQS (35 ppm); and 1.31 ppm for the eight-hour average design value, less than 15 percent of the eight-hour NAAQS (9 ppm). Despite CO emissions from local sources, the TCEQ does not agree with the need for ambient CO monitoring in the Corpus Christi region at this time.

The TCEQ Monitoring Division works closely with the Toxicology and Air Quality divisions, data validation experts, and the EPA when analyzing the existing Texas ambient air monitoring network. Recommendations for monitoring sites from internal and external stakeholders are reviewed based on air modeling and emissions analysis, meteorological data, regional CAMS data validation, exceptional event analysis, state initiatives, and federal monitoring requirements.

As cited in the 2015 Texas Five-Year Ambient Monitoring Network Assessment plan and previous AMNPs, the TCEQ has historically determined that the existing air monitoring network in the Corpus Christi region is adequate to meet the needs of San Patricio County. However, with consideration to the comments submitted to this AMNP and given the industry and population growth in the Portland-Gregory area, the TCEQ Monitoring Division, Toxicology Division, Air Quality Division, and Corpus Christi Regional Office are evaluating the potential placement of additional ambient monitors in San Patricio County.

The TCEQ appreciates the commenters' concerns regarding exceedance of allowable emissions. While permit compliance falls outside of the scope of this plan, the TCEQ Monitoring Division provided these comments to the appropriate division of the TCEQ Office of Compliance and Enforcement. Further concerns may be directed to the TCEQ Regional Office in Corpus Christi for assistance regarding public health or permit compliance issues. The Corpus Christi staff can be reached at: 361-825-3100.

Comment 3: The Capital Area Council of Governments (CAPCOG) Central Texas Clean Air Coalition submitted a comment with four points regarding the placement and decommissioning of monitors in the Austin area:

- Reconsideration of the reduction of monitoring resources for non-federally required monitors in the Austin area. CAPCOG posits that population growth should serve as a criterion the TCEQ utilizes to determine equitable distribution of discretionary monitoring resources "on a per capita basis."
- Decommission of other samplers not used to meet federal requirements in lieu of decommissioning the particulate matter of 2.5 micrometers or less in diameter ($PM_{2.5}$) sampler at the Austin Northwest site (CAMS 3).

- Maintain the current number of $PM_{2.5}$ monitors in the Austin area. If decommissioning equipment is necessary, decommission the $PM_{2.5}$ sampler at the Austin Audubon site (CAMS 38) rather than CAMS 3.
- Deployment of an O_3 monitor at the Webberville Road site (CAMS 171).

Response 3: The TCEQ appreciates the comments on the air monitoring network in the Austin area. Population is one factor used in the network design criteria for ambient air monitoring outlined in 40 CFR Part 58, Appendix D, and also used by the TCEQ when determining monitor placement. However, the TCEQ does not agree that monitoring resources should be evaluated primarily based on equitable distribution per capita. Monitoring resources may not be distributed equally "on a per capita basis" if a region demonstrates the need for additional monitors beyond population requirements due to proximity to industrial sources, high emissions concentrations, public health concerns, or other factors. Although the population in the Austin area exceeds that of some regions with a higher proportion of air monitoring sites, Austin has fewer industrial facilities and emissions concerns than those regions. The TCEQ evaluated emissions inventories during the five-year assessment in 2015, and did not identify a need for additional monitoring in the Austin area. TCEQ air monitoring sites have increased proportionately with Austin population as required by 40 CFR Part 58, Appendix D. As described in the AMNP, the TCEQ air monitoring network is meeting or exceeding all monitoring requirements. The TCEQ will continue to evaluate the needs of the Austin area as the region grows, including the need for additional population-based monitors.

The TCEQ researched the Austin area $PM_{2.5}$ monitoring network in response to comments received, and concluded that the CAMS 3 $PM_{2.5}$ continuous monitor should remain in operation. CAMS 3 is strategically sited to provide the public with air quality data due to its location at a school and the surrounding area population density. This change will be reflected in the final version of the 2017 AMNP.

The TCEQ performs an annual evaluation of the $PM_{2.5}$ continuous network by region to assess and determine if the existing network of monitors should be added, moved, or decommissioned to best understand and evaluate air quality on a regional and statewide basis given resource availability. CAPCOG commented, "It is important not to decrease the level of TCEQ monitoring resources for the Austin area." The recommended air monitoring changes to an area are not determined based on increasing or decreasing local area total monitoring resources. During the 2017 $PM_{2.5}$ continuous network evaluation, it was determined that the network monitoring needs changed for several areas, including Austin-Round Rock. $PM_{2.5}$ design values for this area have remained consistently below the annual and 24-hour $PM_{2.5}$ NAAQS as shown in the 2015 *Texas Five-Year Ambient Monitoring Network Assessment* plan. The $PM_{2.5}$ design value decreasing trend in this area does not indicate a need to maintain the current number of $PM_{2.5}$ continuous monitors, allowing the TCEQ to better utilize resources in other areas. The TCEQ will recommend to decommission the $PM_{2.5}$ monitor at CAMS 38 in lieu of CAMS 3 (as described above).

The TCEQ acknowledges the request for additional O_3 monitoring in East Austin, where CAMS 171 is currently located. The TCEQ evaluates recommendations for additional monitors by reviewing current federal requirements, the local need for monitors to assess public health impacts, and available resources. The TCEQ maintains that there is no regulatory benefit for O_3 monitor placement in East Austin at this time. CAPCOG

correctly identified that the TCEQ operates two O_3 monitors, located downwind of the Austin urban core; these two monitors are expected to represent the highest O_3 concentrations in the Austin area. The TCEQ supports eight additional non-regulatory O_3 monitors operated by CAPCOG, and St. Edward's University operates one O_3 monitor upwind of the urban core. This extensive network provides a total of 11 O_3 monitors equitably distributed around the Austin region, including east and southeast Austin.

Non-regulatory monitors do not provide data that can be directly compared to the NAAQS, but these data are valuable in identifying air quality issues that may necessitate additional regulatory monitors. Data provided by non-regulatory O_3 monitors in the Austin area do not support the need for additional regulatory monitors at this time. The TCEQ determined that the current number and placement of O_3 monitors in the Austin area is sufficient to fulfill regulatory requirements and provide the public with appropriate representation of O_3 values throughout the region. The evaluation remains consistent with the response provided in the 2016 AMNP. Evaluation of monitoring needs will continue in the future and any recommended changes will be published in the 2018 AMNP.

Comment from Portland Citizens United

May 19, 2017

Texas Commissions on Environmental Quality
Ms. Holly Landuyt, MC-165
P.O. Box 13087
Austin, Texas 78711-3087
Via email to: monops@tceq.texas.gov

Dear Ms. Landuyt:

The following comments are provided by Portland Citizens United, an active grassroots organization that was formed primarily to oppose the construction of the new EXXON/SABIC petrochemical facility that is currently seeking air and water permits to operate just beyond the city limits of Portland. Since its formation just eight months ago, our advocacy has extended beyond this single facility to include a broader approach and critical analysis of the industrial growth encroaching upon Portland and neighboring communities and the impact of this unprecedented growth to the quality of our air, and concomitantly, our health and quality of life.

Many citizens in San Patricio County are concerned about the lack of and need for ambient air monitoring on the north side of Nueces Bay within the Corpus Christi Urban Airshed. While considering the Port of Corpus Christi industries to the south, in addition to the recent industrial growth in San Patricio County along Corpus Christi Bay, the predominant south, southwest, and southeast winds position the cities of Gregory, Portland, Ingleside, and Taft downwind of many industrial pollutant point sources while lacking ambient air monitoring by TCEQ. The Texas Commission on Environmental Quality 2017Annual Monitoring Network Plan does not contain any ambient air monitors in San Patricio County.

The attached chart shows the reported or permitted annual amount of pollutants emitted in San Patricio County along Corpus Christi Bay as well as the point source proximity to schools and housing. The elementary schools in Gregory and Portland are directly downwind from pollutants as well as homes in the communities (IE: Bay Ridge and Northshore subdivisions). It is in the public interest that ambient air monitors are placed in areas that can detect CO, NOx, and PM. We request that air monitors are appropriately sited for both health effects evaluations and evaluation of ozone precursor emissions. Air monitors provide relevant data to assess concentrations in a populated area as well as vulnerable populations such as children.

According to the *Texas Five-Year Ambient Monitoring Network Assessment-2015,* since the last five-year network assessment, no significant changes to the ozone monitoring networks have occurred and there are no NOx monitors in the Corpus Christi Airshed. In the proposed 2017Annual Monitoring Network Plan there appears to be no planned monitoring of the emissions in San Patricio County. Considering new industrial construction and wind direction and noting that NOx is a contributor to $PM_{2.5}$ and ozone formation, a NOx monitor in San Patricio County would aid in achieving established monitoring objectives. According to modeling contained in the Corpus Christi Liquefaction permit, predicted NOx concentrations exceed the PDS NAAQS and extend northwest of the facility past the fence line. The Radius of Impact was rounded up to 5.5 miles. The subdivision of Bay Ridge, East Cliff Elementary school and Stephen F Austin Elementary school are all northwest of the CCL facility and at a distance of 1.37 miles, 1.68 miles, and 2.29 miles, respectively.

$PM_{2.5}$ is measured at three sites in the Corpus Christi area and not in San Patricio County. The TCEQ currently operates a monitor at the Corpus Christi Huisache site and a continuous monitor at the Dona Park site. In addition to these monitors, a supplemental speciation monitor is located at the Dona Park site and a continuous $PM_{2.5}$ monitor is located at the National Seashore site. In light of the recent large amount of fine, metallic particles being deposited in the Bay Ridge and Northshore subdivisions and the TCEQ investigation, installing a real-time fine particle $PM_{2.5}$ monitor would enable TCEQ to estimate benzo-alpha-pyrene emissions and other PAHs known to be present in soot emissions. The subdivision of Bay Ridge, East Cliff Elementary school and Stephen F Austin Elementary school are northwest of the Voestalpine facility and at a distance of 0.75 miles, 1.03 miles, and 2.16 miles respectively. The Northshore subdivision is 0.6 miles from Voestalpine. Voestalpine maximum allowable emission for CO is 4308.8 TPY.

As additional air permits in San Patricio County are being sought by heavy industry at a rapid rate, the air around existing populations encompassed by these facilities should be closely monitored for air pollutants by the Texas Commission on Environment Quality to "protect our state's public health and natural resources consistent with sustainable economic development. Our goal is clean air, clean water, and the safe management of waste", too.

Respectfully submitted,
Portland Citizens United
Errol A Summerlin
By: Errol A. Summerlin
1017 Diomede
Portland, Tx. 78374
(361) 960-5313
summerline@verizon.net

cc: Senator Judith Zaffirini
cc: Representative J.M. Lozano

SUMMARY OF POLLUTANTS EMITTED ANNUALLY IN EAST SAN PATRICIO COUNTY

TCEQ REGISTRATION NUMBER	COMPANY	SITE	CO TPY	Nox TPY	PM 10 TPY	PM 2.5 TPY	SO2 TPY	VOC TPY	MILES TO EAST CLIFF ELEM	MILES TO BAY RIDGE	MILES TO SF AUSTIN ELEM	MILES TO NORTH SHORE
RN102203445	GULF MARINE FAB INC	SOUTH YARD	2.298	10.664	6.074	3.113	0.706	12.1259				
RN101623254	CHEMOURS CO FC LLC	CHEMOURS	6.2874	9.5974	1.7777	1.7395	0.2237	8.1517				
RN102594678	SOUTHCROSS GATHERING LTD	GREGORY	112.05	100.16	4.8591	4.8591	0.3474	41.6797				
RN102318847	SHERWIN ALUMINA CO LLC	SHERWIN PLAN	148.72	32.3801	124.7641	41.2472	13.663	40.316				
RN100222744	FLINT HILLS RESOURCES CC LLC	INGLESIDE TER	15.482	17.5529	1.5643	1.3598	0.0466	45.2087				
RN100211176	OCCIDENTAL CHEMICAL CORP	INGLESIDE PLA	100.14	524.844	101.4462	38.8672	2.2898	42.4926				
RN102547957	GREGORY POWER PARTNERS LP	GREGORY POW	30.06	499.35	133.0789	130.657	9.3816	4.9218				
RN102582392	CANTERA ENERGY LLC	EAST WHITE PO	3.5825	59.01	0.01	0.01	0.001	10.2092				
RN102905064	KIEWITT OFFSHORE SER LTD	FABRICATION Y	0	0	0.756	0.1174	0	33.0294				
RN105835318	EOG RESOURCES INC	NUECES BAY	4.7835	11.9159	0.0969	0.0969	0.0083	14.1777				
RN106408628	XTO ENERGY INC	MCKAMEY TAN	10.06	6.8074	0.15	0.15	0.0093	11.9443				
RN106224447	TPCO AMERICA CORP	TPCO TX	1.429	1.704	0.129	0.129	0.0735	0.093	2.25	1.48	0.77	2.39
RN104104716	CC LIQUEFACTION LLC	GREGORY	505.36	418.49		4.82	9.62	48.47	1.68	1.37	2.29	1.37
RN106597875	VOESTALPINE	LA QUINTA	4308.6	394.51	63.53	33.51	34.82	35.76	1.03	0.75	2.16	0.6
TOTAL			5248.8	2086.98	438.2362	260.676	71.191	348.58				

DATA FROM COMPANIES 1-12 WERE SELF-REPORTED EMISSIONS IN 2015

CCL (CHENIERE) DATA IS EMISSIONS PROJECTED FROM MODELING IN PERMIT IN 2014

VOESTALPINE DATA IS MAXIMUM ALLOWABLE EMISSION IN PER 2016

Comment from Kristen Howard

From: Kristen-Prokitesurf

Sent: Monday, May 22, 2017 3:17 PM
To: MONOPS

Subject: Air quality monitoring in San Patricio County

Ms. Landuyt,

I urge you and your agency to immediately put measures into place to monitor the air quality in San Patricio County, Texas. In addition to the noise and light pollution that has been emitted by voestalpine during the past 9+ months, those of us living in Portland and throughout San Patricio County have recently become aware that they are contaminating the air with a metallic dust that is blowing across portions of our city, as your agency has been made aware.

It is extremely disheartening that an industry can set up shop in our backyard (from another country in this case) and display no regard for the citizens living there. Voestalpine has demonstrated throughout the last 9+ months that they have no concern for the well-being of the many thousands of citizens who are directly impacted by their actions. This latest disregard for quality of life will undoubtedly manifest in health repercussions for the citizens of Portland and San Patricio county.

Thank you for your time,

Kristen Howard

Comment from Annette Hedemann

From: Hedemann, Annette
Sent: Wednesday, May 24, 2017 10:27 AM
To: MONOPS
Subject: Air Monitoring in the Portland Texas Area

To those living in this area the need for such monitoring is blatantly obvious. There are days when my neighbors children can't play outside without coughing violently. My white vehicle can't be left out overnight without being coated in a mix of morning dew and a thick layer of dust that has to be hosed off so I can see out of the windows.

This portion of the Texas Gulf Coast is rapidly becoming too polluted to sustain a healthy life. Portland is in the process of building a sports complex/park very near the new proposed Exxon/SABIC plant. Pollution poses a real danger to the children and adults that will be making use of the area.

I have read all of the information that has been made public, for and against the new plant. We can, however make positive changes to the large industry that has already established itself here in the area. I am POSITIVE they have and are violating the allowable pollutants set forth in the clean air act.

I have brought this up more than once but I will do so again. The area between the proposed Exxon/SABIC plant floods easily. The homes in this area have been flooded multiple times and many of the homes have flood barriers and flood doors.

The area proposed for the plant was deeply flooded this morning, after the storm last night. I would guess that the plan is to elevate the landscape before construction, thus compounding the flooding in the immediate area, including the streets, highway and residences.

I have heard the they plan a sort of berm with trees etc. to help contain particulate matter. As this build in the soil, a heavy rain will wash it into homes, schools and eventually our precious bays. If there is any data on the proposed solution to this issue, please send me in the right direction. Exxon has already stated on their application that the best measures to avoid polluting the area would be too costly.

I think putting any person that has chosen to live in this area at risk for innumerable health problems, is too costly.

Please monitor the Portland Texas area and thank you for any information you can steer me to about the very real flooding issue.

Annette LaBadie Hedemann

Buyer – Dept of Marine Science
University of Texas at Austin
Marine Science Institute
750 Channel View Dr.
Port Aransas, TX 78373
Phone (361) 749-6785
Fax (361) 749-6707

Comment from Scott Hagarty

To whom it may concern,

I am a resident of Portland Texas and I am profoundly concerned about the total lack of air monitors in San Patricio county. The Texas Commission on Environmental Quality 2017Annual Monitoring Network Plan makes no mention of adding any ambient air monitors in San Patricio County. I believe there is a sufficient need for air monitors in our county. I local resident and friend has compiled some compelling data showing this need, and that table of data is contained below.

As I'm sure the TCEQ would be aware, the chart below shows the reported or permitted annual amount of pollutants emitted in San Patricio County along Corpus Christi Bay as well as the point source proximity to schools and housing. The elementary schools in Gregory and Portland are directly downwind from pollutants as well as homes in the communities (IE: Bay Ridge and Northshore subdivisions). It is in the public interest that ambient air monitors are placed in areas that can detect CO, NOx, and PM. We request that air monitors are appropriately sited for both health effects evaluations and evaluation of ozone precursor emissions. Air monitors provide relevant data to assess concentrations in a populated area as well as vulnerable populations such as children.

According to the *Texas Five-Year Ambient Monitoring Network Assessment-2015,* since the last five-year network assessment, no significant changes to the ozone monitoring networks have occurred and there are no NOx monitors in the Corpus Christi Airshed. In the proposed 2017Annual Monitoring Network Plan there appears to be no planned monitoring of the emissions in San Patricio County. Considering new industrial construction and wind direction and noting that NOx is a contributor to $PM_{2.5}$ and ozone formation, a NOx monitor in San Patricio County would aid in achieving established monitoring objectives. According to modeling contained in the Corpus Christi Liquefaction permit, predicted NOx concentrations exceed the PDS NAAQS and extend northwest of the facility past the fence line. The Radius of Impact was rounded up to 5.5 miles. The subdivision of Bay Ridge, East Cliff Elementary school and Stephen F Austin Elementary school are all northwest of the CCL facility and at a distance of 1.37 miles, 1.68 miles, and 2.29 miles, respectively.

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As additional air permits in San Patricio County are being sought by heavy industry at a rapid rate, the air around existing populations encompassed by these facilities should be closely monitored for air pollutants by the Texas Commission on Environment Quality to "protect our state's public health and natural resources consistent with sustainable economic development. Our goal is clean air, clean water, and the safe management of waste", too.

Respectfully submitted,

Scott Hagarty

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VOESTALPINE DATA IS MAXIMUM ALLOWABLE EMISSION IN PER 2016

Capital Area Council of Governments
6800 Burleson Road, Building 310, Suite 165 Austin, Texas 78744-2306
(p) 512.916.6000 (f) 512.916.6001
www.capcog.org

BASTROP BLANCO BURNET CALDWELL FAYETTE HAYS LEE LLANO TRAVIS WILLIAMSON

May 24, 2017

Holly Landuyt
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087, MC-165
Austin, Texas 78711-3087

RE: Comments on TCEQ's 2017 Annual Monitoring Network Plan

Dear Ms. Landuyt:

The Capital Area Council of Governments (CAPCOG) Central Texas Clean Air Coalition (CAC) appreciates this opportunity to comment on the TCEQ's *2017 Annual Monitoring Network Plan.* The CAC respectfully submits the following comments on the Plan:

1. **The TCEQ is already dedicating significantly fewer of its discretionary monitoring resources (samplers not used to meet federal requirements) to the Austin area on a per capita basis than it is dedicating to most of the other metro areas of the state: the CAC urges you to reconsider plans to further reduce the resources it dedicates to our region.**
2. **The CAC strongly encourages TCEQ to decommission other samplers not used to meet federal requirements rather than decommission the continuous fine particulate matter ($PM_{2.5}$) sampler at Continuous Air Monitoring Station (CAMS) 3, given its role in measuring population exposure to $PM_{2.5}$, the ability to conduct co-pollutant analysis using this sampler in conjunction with the other samplers at this station, the population and population growth of the region, and the high value of continuous $PM_{2.5}$ measurements for air quality forecasting.**
3. **The CAC believes that it is important not to decrease the level of TCEQ monitoring resources for the Austin area in light of the region's population and air pollution levels, but if resource constraints make it necessary to decommission a continuous $PM_{2.5}$ sampler in the region, the CAC would prefer that the TCEQ target the continuous sampler at CAMS 38 instead of the continuous sampler at CAMS 3.**
4. **The CAC reiterates its request that TCEQ consider co-locating an ozone monitor at CAMS 171.**

A detailed justification for each of these points is attached. We appreciate your consideration of these comments and welcome any discussion TCEQ staff may wish to have with us on air monitoring in the region.

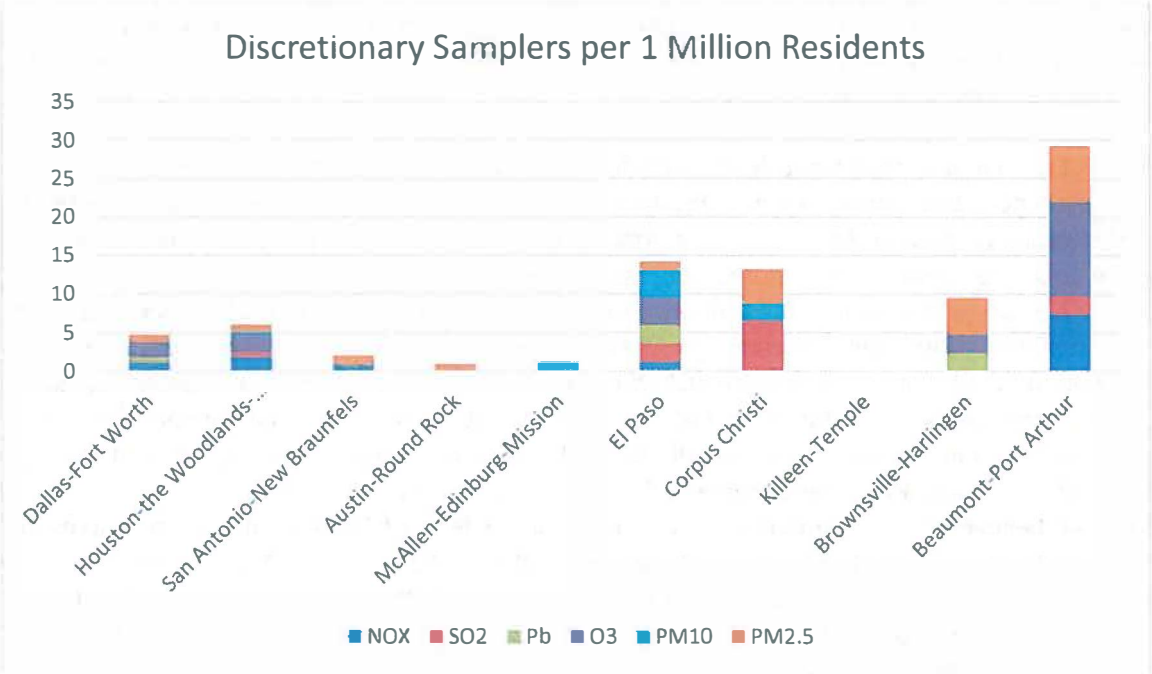
Sincerely,

Sarah Eckhardt

Travis County Judge, Chair of the Central Texas Clean Air Coalition

1. The TCEQ is already dedicating significantly fewer of its discretionary monitoring resources (samplers not being used to meet federal requirements) to the Austin area on a per capita basis than it is dedicating to most of the other metro areas of the state: the CAC urges you to reconsider plans to further reduce the resources it dedicates to our region.

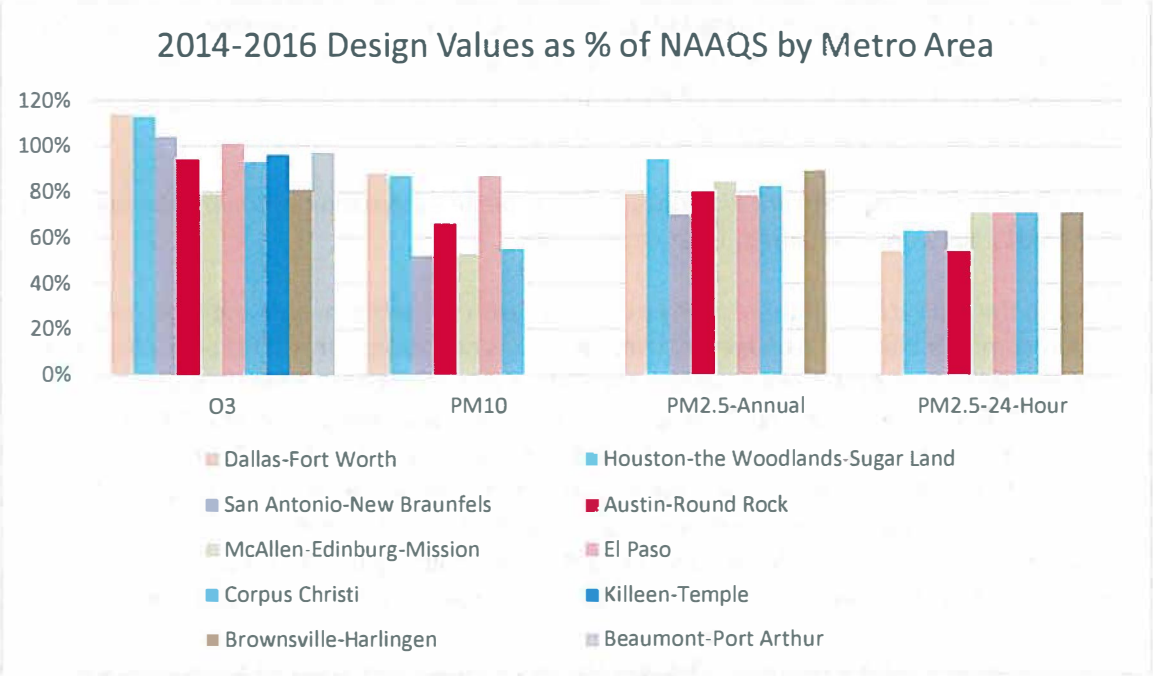
TCEQ's only stated rationale for proposing to decommission the continuous $PM_{2.5}$ sampler at CAMS 3 is that it exceeds the area's regulatory requirements. However, as Appendix I to the *2017 Annual Monitoring Network Plan* shows, the TCEQ is currently operating 26 other continuous $PM_{2.5}$ samplers that are not being used to meet regulatory requirements, and as Appendix B shows, the TCEQ is operating a total of 140 samplers that are not being used to meet federal requirements. To the extent that TCEQ has discretion over the deployment of these 140 samplers, the CAC believes that current population and population growth should be considered in how these resources are distributed throughout the state and the TCEQ ought to ensure a greater degree equity in resource distribution in this regard. The following table highlights the current disparity in resource distribution in terms of current population coverage.



The Austin-Round Rock metro area also continues to significantly outpace all of the other metro areas in the state in growth. The region's population grew by 2.9% between 2015 and 2016, which is a third faster than the next-fastest growing metro area in the state, and significantly ahead of the 2.0% growth in the Dallas-Fort Worth (DFW) and San Antonio-New Braunfels metro areas and the 1.9% in the Houston-the Woodlands-Sugarland metro area. This means that without additional resources, the Austin-Round Rock area's coverage per capita will continue to decline relative to other metro areas of the state, and a decrease in monitoring resources will further increase the existing disparity.

While the number of monitors per million residents is certainly not the only way to measure the equity in resource distribution, and other factors such as the regions' design values are arguably just as relevant to that decision, it is not obvious from looking at the regions' design values why the Austin-Round Rock metro area should only be getting 1.46 extra monitors per million people (which would

decrease to 0.96 extra monitors per million people), while other areas of the state are getting many times that level of resources despite not necessarily having appreciably higher design values than the Austin area.



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As previously mentioned, the TCEQ's only stated rationale for proposing to decommission the $PM_{2.5}$ sampler at CAMS 3 is that it exceeds area requirements. The CAC does not believe that this is a sufficient rationale for decommissioning this sampler, given that there are numerous samplers that TCEQ maintains across the state that also exceed area requirements that are not being targeted for decommissioning. One potential basis TCEQ could point to for this proposal would be its evaluation that that that this sampler only has a "medium" value in its 2015 *Texas Five-Year Ambient Monitoring Network Assessment*. However, there are a total of 17 continuous $PM_{2.5}$ samplers that TCEQ rated as having a "medium" value across the state in this Assessment, but the TCEQ targeted CAMS 3 and only one other sampler for decommissioning in the *2017 Annual Monitoring Network Plan*, without explaining why these two were targeted rather than the other 15.

In its 2015 *Texas Five-Year Ambient Monitoring Network Assessment*, the TCEQ described $PM_{2.5}$ sampling at CAMS 3 as follows:

- "$PM_{2.5}$ monitors at the Austin Northwest, CPS Pecan Valley, Old Highway 90, Palo Alto, and Selma sites are located in populated urban core areas and continue to provide meaningful data on ambient $PM_{2.5}$ concentrations in areas frequented by the public, as well as $PM_{2.5}$ movement throughout the area."

- "Although the number of continuous monitors in these areas exceeds minimum requirements, all of these monitors are considered of at least medium value because of the spatial coverage, historical trends, and unique data they provide"
- "None of the monitor pairs had a strong correlation (Pearson's coefficient >0.976, relative difference <0.1). The Austin Northwest (AQS-48-453-0014) and Austin Audubon Society (AQS-453-0020) monitors were moderately correlated (Person's coefficient = 0.976, relative difference=0.128), but were located 18 kilometers apart. All four continuous $PM_{2.5}$ monitors allow for spatial coverage throughout the greater Austin area."

TCEQ's *2017 Annual Monitoring Network Plan* does not provide an explanation as to why the logic that was used in the 2015 Network Assessment is no longer valid.

The TCEQ has also not indicated that there is any external reason for decommissioning these samplers, such as an EPA recommendation or a budgetary constraint. It is not obvious from this plan what TCEQ would be able to afford to do by decommissioning the $PM_{2.5}$ sampler at CAMS 3 that would be of higher value than leaving it in service. It is also not obvious that the $PM_{2.5}$ data being collected at CAMS 3 is less valuable than data that is being collected at any of the other 139 samplers that TCEQ is operating throughout the state that are also not being used to meet federal requirements. The TCEQ should conduct an analysis of how the various monitoring objectives EPA identifies in its *Ambient Air Monitoring Assessment Guidance* would be affected by decommissioning the continuous $PM_{2.5}$ sampler at CAMS 3 compared to decommissioning a different sampler elsewhere. Relevant objectives include:

- Develop scientific understanding of air quality by supporting other types of assessments or analyses
- Understand historical trends in air quality
- Characterize specific geographic locations or emissions sources
- Track the spatial distribution of air pollutants
- Evaluate population exposures to air pollutants

The CAC also notes that the EPA specifically identifies continuous $PM_{2.5}$ monitors as being "very valuable" for forecasting assistance in this guidance, and that therefore the loss of a continuous $PM_{2.5}$ monitor in the Austin area would be expected to diminish the ability of TCEQ to provide accurate $PM_{2.5}$ forecasts for the region.

3. The CAC believes that it is important not to decrease the level of TCEQ monitoring resources for the Austin area, but if resource constraints make it necessary to decommission a continuous $PM_{2.5}$ sampler in the region, the CAC would prefer that the TCEQ target the continuous sampler at CAMS 38 instead of the continuous sampler at CAMS 3.

We understand that in a phone conversation between TCEQ staff and CAPCOG's Director of Regional Services on May 5, 2017, TCEQ staff provided some explanation for the agency's thinking in proposing to decommission the continuous $PM_{2.5}$ sampler at CAMS 3. It is our understanding that TCEQ staff communicated that one of the primary reasons that the continuous $PM_{2.5}$ sampler at CAMS 3 was targeted for decommissioning was TCEQ staff's belief that its data would be duplicative of the data that started being collected at CAMS 1068 earlier in 2017. While CAMS 3 is relatively close to CAMS 1068 (6.5 kilometers away), this assertion does not account for the difference in the purposes, spatial scales, and temporal scales of these samplers.

Appendix A to TCEQ's *2017 Annual Monitoring Network Plan* includes the following information on the five sites within the CAPCOG region with $PM_{2.5}$ sampling:

Table 1. $PM_{2.5}$ Monitoring Stations in the CAPCOG Region in Appendix A

Station	Continuous $PM_{2.5}$ Sampling?	Location Setting	Monitoring Objective	Spatial Scale
CAMS 3	Yes	Suburban	Population Exposure	Neighborhood
CAMS 38	Yes	Rural	Population Exposure	Neighborhood
CAMS 171	Yes	Urban and Center City	Population Exposure	Neighborhood
CAMS 601	Yes	Rural	Regional Transport; Source-Oriented	Regional Scale
CAMS 1068	No	Urban and Center City	Maximum Precursor Emissions Impact	Microscale

As the table above shows, while CAMS 3 is located somewhat close to CAMS 1068, the $PM_{2.5}$ sampler currently located at CAMS 1068 is not duplicative of CAMS 3 in terms of each $PM_{2.5}$ sampler's temporal scale, location setting, monitoring objective supported, or spatial scale.

As is stated above, the CAC generally disagrees that it is either necessary or appropriate to reduce the level of monitoring resources TCEQ is providing to the Austin area. However, to the extent that this comment period provides an opportunity for the CAC to communicate its priorities for the deployment of monitoring resources within the region and help limit the harm we think such a decrease in monitoring resources would entail, we wish to encourage TCEQ to re-prioritize the three stations with continuous $PM_{2.5}$ samplers.

Among the three CAMS that collect continuous $PM_{2.5}$ measurements in Travis County in order to measure population exposure, the CAC would prioritize them as follows, based both on the population within 0.5 – 4.0 kilometers (the spatial scale corresponding to the "neighborhood" scale described in 40 CFR Part 58, Appendix D) and the 3-year average annual $PM_{2.5}$ concentrations at each site. Each of these metrics suggests that CAMS 171 should be the highest priority continuous PM2.5 sampler, followed by CAMS 3, followed by CAMS 38.

Table 2. CAC Priority Ranking for Continuous $PM_{2.5}$ Sampling for Population Exposure in the Austin-Round Rock Metro Area

Station	Priority Rank	Location Setting	Population within 0.5 km of Station	Population within 4.0 km of Station	3-Year Annual $PM_{2.5}$ Concentration Avg. ($\mu g/m^3$)
CAMS 171	1	Urban and Center City	1,741	99,754	9.6
CAMS 3	2	Suburban	1,338	62,239	7.8
CAMS 38	3	Rural	161	22,004	7.7

And whereas the only other pollutant parameters measured at CAMS 38 are ozone and PM_{10}, other parameters at CAMS 3 include ozone, nitrogen oxides, and sulfur dioxide sampling as well. CAMS 171 is equipped with PM_{10} and a VOC canister sampler. Continuous $PM_{2.5}$ sampling at CAMS 3 and 171

therefore provides more extensive opportunities for multipollutant analysis than continuous sampling at CAMS 38.

4. The CAC reiterates its request that TCEQ consider co-locating an ozone monitor at CAMS 171.

In response to TCEQ's *2016 Annual Monitoring Network Plan*, the CAC had proposed that TCEQ deploy at least one additional regulatory ozone monitor in the Austin area using its own resources, and that CAMS 171 would be an appropriate location to put it. Points in support of this suggestion included the following:

- Adding ozone sampling to CAMS 171 would enable additional multi-pollutant analysis, due to existing PM and VOC sampling at the site
- An ozone sampler at CAMS 171 would not be expected to be as "highly correlated" to measurements at CAMS 3 or CAMS 38 as the ozone measurements at these sites are with each other
- An ozone sampler at CAMS 171 would not be expected to adversely affect the region's design value due to its location upwind of the urban core on most high ozone days, but could prove useful in better representing the spatial distribution of ozone within the Austin urbanized area and transport within the region

In response to the CAC's comments, the TCEQ stated the following:

"*The TCEQ evaluated likely sources of precursor emissions and area topographical and meteorological information in order to select both an upwind location (to evaluate transport into the urban core) and a downwind location that was the most likely to observe the highest O_3 concentrations in the Austin-Round Rock metropolitan statistical area (MSA). The TCEQ agrees with CAPCOG's assertion that East Austin is upwind of the urban core on virtually all days when the region traditionally sees high O_3 measurements, and therefore does not agree that there is a regulatory benefit for monitor placement in East Austin at this time. The placement of these regulatory monitors, in addition to the supplemental information provided by non-regulatory monitors, provides a high degree of certainty that the monitored O_3 concentrations are representative of the entire Austin-Round Rock MSA. At this time, TCEQ has no information that additional monitoring is needed in East Austin.*"

The CAC would like to point out that TCEQ does not currently operate any O_3 monitors upwind of the Austin urban core as described above. The CAC would also like to point out that the work plan that TCEQ recently approved for CAPCOG's near-nonattainment area grant for the 2018-2019 biennium envisions a substantial reduction in CAPCOG's ozone monitoring budget, which could reduce the number of ozone monitors CAPCOG will be operating from eight to five, redirecting these resources to other projects. The CAC suggests that the TCEQ consider deploying an upwind monitor for the Austin area, possibly at CAMS 171, and make that decision independent of the resources that CAPCOG chooses to dedicate to ozone monitoring or where those resources might deployed in 2018 and 2019, since those decisions have not yet been made.

Comment from Joyce Bjork

From: joycebjork
Sent: Saturday, May 27, 2017 5:04 PM
To: MONOPS >
Subject: AIR QUALITY TESTING IN SAN PATRICIO COUNTY

We need air quality testing in San Patricio County which will be in the vicinity of the Voestalpine plant. What we have been seeing lately is quite alarming.

And with the advent of the SABIC/Exxon-Mobil plant, air quality testing will be even more important. The future of our children is at stake. The rest of us count, too.

Thank you.

Joyce Bjork

102 Marie Place

Portland TX 78374

361-643-6816

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May 31, 2017

Texas Commission on Environmental Quality
Ms. Holly Landuyt, MC-165
P.O. Box 13087
Austin, Texas 78711-3087
Via email to: monops@tceq.texas.gov

Re: Comments to Texas Annual Monitoring Plan for 2017

Dear Ms. Landuyt:

The Hillcrest Residents Association (HRA) is a neighborhood group that has advocated for quality of life in Corpus Christi's historically black Hillcrest neighborhood for decades. Because of Hillcrest's proximity to Corpus Christi's Refinery Row, HRA is concerned about air quality and the effects of elevated ozone levels on residents with respiratory sensitivities. We respectfully submit these comments on the Texas Annual Monitoring Plan for 2017. These comments are specific to ozone (O_3) continuous air monitors (CAMS) for the Corpus Christi airshed, CAMS 4 and CAMS 21, and to the omission of research grade monitors CAMS 660, 664, and 685 from the plan.

The 2017 annual plan does not provide enough information to demonstrate that the monitoring network meets the siting requirements of Appendix D to 40 C.F.R. 58. The plan does not discuss why the O_3 monitors in the Corpus Christi airshed are sited where they are or provide analysis of whether they are located in places that meet regulatory standards. Appendix D to 40 C.F.R. 58 1.1.1. requires: "Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region, and air pollution levels near specific sources." The annual monitoring plan for 2017 does not provide sufficient basis to show that the monitoring sites meet these specific standards. Specifically, TCEQ has not provided any information so that HRA can comment on whether CAMS 4 and CAMS 21:

(1) measure peak air pollution levels in the airshed, that is, are they located downwind from ozone precursors and transport areas, where the highest ozone levels should occur;
(2) are situated to measure typical levels in populated areas, since the CAMS are not located in densely populated areas;
(3) are located to best measure transport of ozone precursors from areas expected to produce ozone in the region, for instance in areas where emissions fro Houston and Eagle Ford shale production are likely to affect air quality;

(4) sufficiently measure high ozone spikes caused by to emissions of specific ozone-enhancing VOCs of local refineries.

The 2017 plan provides conclusions without analysis and does not demonstrate that CAMS 4 and CAMS 21 meet the standards of 40 CFR 58.

The 2017 annual plan also does not adequately demonstrate that the monitors meet the other criteria of the appendices to 40 C.F.R. 58. Under 40 C.F.R. 58.10(a)(1), the annual monitoring plan "shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable." While the site list in Appendix A lists the information required by 40 C.F.R. 58.10(b), at least where it is relevant to ozone monitoring, the 2017 plan from TCEQ includes only a statement that all monitors meet the standards instead of individually discussing the monitors. The plan would benefit from a more detailed analysis of each monitor.

Finally, the annual plan does not include information about the research grade monitors operated in the Corpus Christi airshed by the University of North Texas and Texas A&M University—Kingsville. These monitors are CAMS 660, CAMS 664, and CAMS 685. Appendix D to 40 C.F.R. 58 explains that research grade monitors are part of the national air monitoring network and are worthy of discussion "due to their important role in supporting the air quality management program." 40 C.F.R. 58 App. D Sec. 2(b). CAMS 660, 664, and 685 all record ozone levels and meet high scientific standards. TCEQ currently receives ozone monitoring data from these CAMS and reports it on its website. A map of those monitors is attached as Exhibit A to these comments. The information from these monitors contributes to an understanding in particular of transport of ozone from other regions. To better assist the EPA's understanding of air quality in the region, TCEQ should also include information about these monitors in its annual plan.

The 2017 annual monitoring plan is not sufficiently detailed to allow HRA to provide comments regarding whether the ozone monitors in Corpus Christi meet the relevant scientific and legal standards. HRA cannot review TCEQ's analysis because only conclusions are provided in the plan. TCEQ should add analysis of the monitor locations, explain whether they provide the best possible regulatory information, and allow the public to comment on the reasoning of the agency and support for its conclusions. HRA requests an opportunity to comment on such a reasoned analysis.

In addition, TCEQ should include a discussion of the scientific ozone research monitors in the Corpus Christi airshed, CAMS 660, 664, and 685, which will aid EPA in developing a clear picture of the region's air quality status. HRA thanks you for considering these comments and hopes they will help to improve public understanding of the ozone monitoring network.

Respectfully,

Rachel Zummo
Amy Johnson

Cc: Hillcrest Residents Association