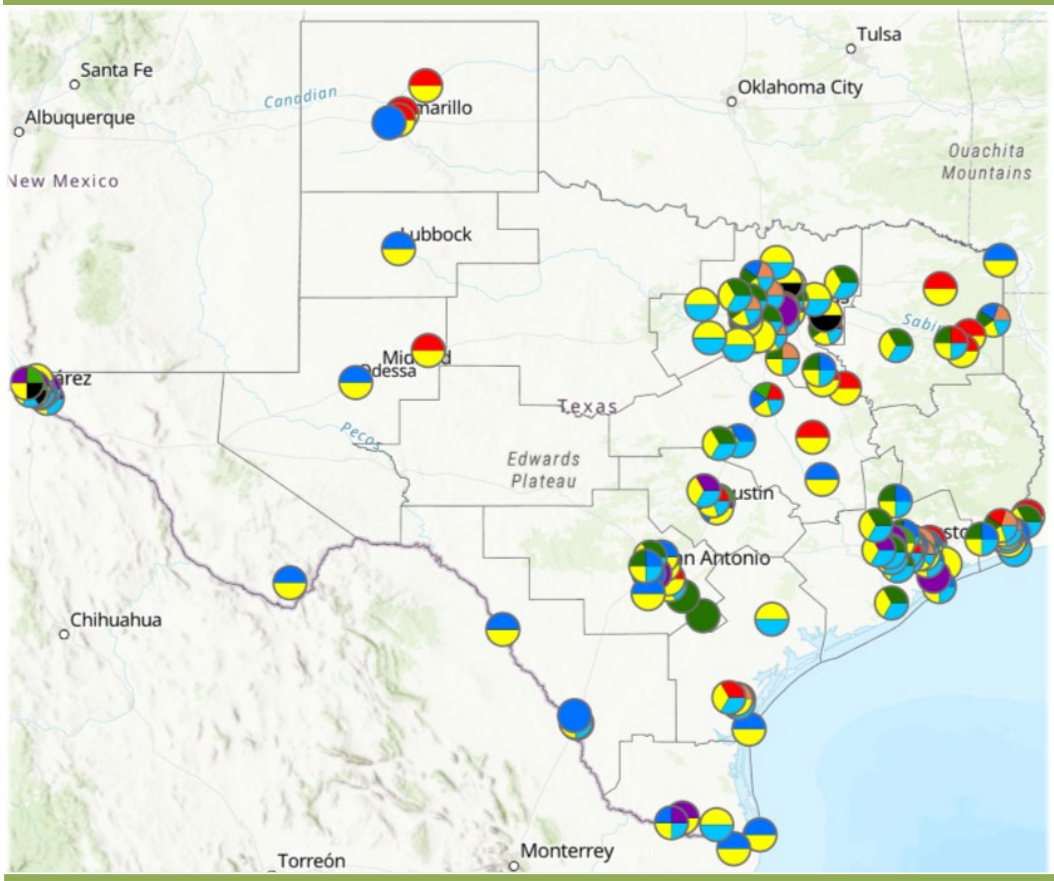
Texas Commission on Environmental Quality
Annual Monitoring Network Plan



P.O. Box 13087
Austin, Texas 78711-3087

July 1, 2020

2020 Texas Commission on Environmental Quality Annual Monitoring Network Plan

Table of Contents

List of Appendices *4*
List of Tables *4*
List of Acronyms and Abbreviations *5*
INTRODUCTION *7*
REGULATORY NETWORK REVIEW 8
Nitrogen Dioxide *8*
Monitoring Requirements 8
Previously Recommended Changes 9
Regulatory NO_2 Monitoring Network Changes 10
Sulfur Dioxide *10*
Monitoring Requirements 10
Previously Recommended Changes 11
Regulatory SO_2 Monitoring Network Changes 11
Lead *12*
Monitoring Requirements 12
Previously Recommended Changes 13
Regulatory Pb Monitoring Network Changes 13
Ozone *13*
Monitoring Requirements 14
Previously Recommended Changes 14
Regulatory O_3 Monitoring Network Changes 14
Carbon Monoxide *15*
Monitoring Requirements 15
Previously Recommended Changes 15
Regulatory CO Monitoring Network Changes 15
Particulate Matter of 10 Micrometers or Less *15*
Monitoring Requirements 16
Previously Recommended Changes 16
Regulatory PM_{10} Monitoring Network Changes 17
Particulate Matter of 2.5 Micrometers or Less *17*

Monitoring Requirements 17
Previously Recommended Changes 19
Regulatory $PM_{2.5}$ Monitoring Network Changes 22
Volatile Organic Compounds 23
Monitoring Requirements 23
Previously Recommended Changes 23
Regulatory VOC Monitoring Network Changes 23
Carbonyls 23
Monitoring Requirements 23
Previously Recommended Changes 24
Regulatory Carbonyl Monitoring Network Changes 24
Meteorology 24
Monitoring Requirements 24
Previously Recommended Changes 24
Regulatory Meteorology Monitoring Network Changes 25
NON-REGULATORY NETWORK REVIEW 25
Semi-Volatile Organic Compounds 25
CONCLUSION 25

List of Appendices

Appendix A – 2020 Summary of Proposed Network Changes

Appendix B – Ambient Air Monitoring Network Site List

Appendix C – Population and Criteria Pollutant Monitor Status by Metropolitan Statistical Area

Appendix D – Nitrogen Dioxide, Nitrogen Oxide, and Total Reactive Nitrogen Monitor Status

Appendix E – Sulfur Dioxide Monitor Status

Appendix F – Sulfur Dioxide Ongoing Data Requirements Annual Report

Appendix G – Total Suspended Particulate Lead Monitor Status

Appendix H – Ozone Monitor Status

Appendix I – Carbon Monoxide Monitor Status

Appendix J – Particulate Matter of 10 Micrometers or Less Monitor Status

Appendix K – Particulate Matter of 2.5 Micrometers or Less Monitor Status

Appendix L – Volatile Organic Compound and Carbonyl Monitor Status

Appendix M - TCEQ Response to Comments Received on the 2020 Annual Monitoring Network Plan

Appendix N – Comments Received on the 2020 Annual Monitoring Network Plan

List of Tables

Table 1: National Core Multipollutant Monitoring Stations

Table 2: 2016-2018 Lead Point Source Emissions Inventory Data

Table 3: Ozone Monitoring Requirements

Table 4: Particulate Matter of 10 Micrometers or Less Minimum Monitoring Requirements

Table 5: Particulate Matter of 2.5 Micrometers or Less Minimum Monitoring Requirements

Table 6: Particulate Matter of 2.5 Micrometers or Less FEM Quality Control Collocation Requirements

Table 7: Particulate Matter of 2.5 Micrometers or Less Summary of Approved Changes

Table 8: Particulate Matter of 2.5 Micrometers or Less Recommendations and Method Code Changes

List of Acronyms and Abbreviations

– number

§ - part

% – percent

> – greater than

≥ - greater than or equal to

< – less than

$\mu g/m^3$ – micrograms per cubic meter

AMNP – annual monitoring network plan

autoGC – automated gas chromatograph

CBSA – core based statistical area

CFR – Code of Federal Regulations

CO – carbon monoxide

DFW – Dallas-Fort Worth

DRR – Data Requirements Rule

EI – emissions inventory

EPA – United States Environmental Protection Agency

FEM – federal equivalent method

FRM – federal reference method

LBJ – Lyndon B. Johnson

LLC – limited liability company

MSA – metropolitan statistical area

NA – not applicable

NAAQS – National Ambient Air Quality Standards

NCore – National Core Multipollutant Monitoring Stations

NEI – National Emissions Inventory

NO_2 – nitrogen dioxide

NO – nitrogen oxide

NO_x – oxides of nitrogen

NO_y – total reactive nitrogen compounds

O_3 – ozone

PAMS – Photochemical Assessment Monitoring Stations

Pb – lead

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

ppb – parts per billion

PWEI – population weighted emissions index

QC – quality control

RA-40 – Regional Administrator 40

SE – southeast

SLAMS – State or Local Air Monitoring Stations

SO_2 – sulfur dioxide

SPM – special purpose monitor

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

VOC – volatile organic compound

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 available for public inspection and comment for at least 30 days prior to submission to the EPA. The Texas Commission on Environmental Quality (TCEQ) submits the AMNP to the EPA for final review and approval with comments (and responses) received during the 30-day inspection period and with any applicable changes based on the received comments.

The AMNP provides information on the current TCEQ ambient air monitoring network established to determine compliance with federal monitoring requirements specified in 40 CFR §58 and its appendices. This document presents the current federal network established for use in evaluations to determine compliance with the National Ambient Air Quality Standards (NAAQS) and to meet federal monitoring requirements and objectives. This document is limited to the portion of the TCEQ air monitoring network designed to comply with federal monitoring requirements and supported by federal funding. The TCEQ also operates a robust network of state-initiative monitors that support a variety of purposes including potential health effects evaluation, however these monitors are outside the scope of this document and are not included. This document includes the recommended federal monitoring network changes from July 1, 2019, through December 31, 2021, which are summarized in AMNP Appendix A.

Title 40 CFR §58, Appendix D provides the minimum design requirements for air monitoring networks including State or Local Air Monitoring Stations (SLAMS), Photochemical Assessment Monitoring Stations (PAMS), and National Core Multi-Pollutant Monitoring Stations (NCore). AMNP Appendix B lists existing monitors established to meet federal monitoring requirements and objectives.

Based on annual internal audits performed to date, all monitoring sites supporting federal requirements and monitoring objectives are meeting the requirements defined in 40 CFR §58 Appendices A, B, C, D, and E, with the following exceptions.

- The TCEQ is seeking new property owners and developing site specifications to relocate the Midlothian OFW site, which is not meeting siting criteria.
- The TCEQ is assessing network air monitoring probe placement to ensure compliance with 40 CFR §58, Appendix E, Section 2.0.
- The TCEQ requests a waiver under 40 CFR §58, Appendix E, Section 10.1.1 for the existing Austin Webberville site. The Austin Webberville site particulate monitors are located less than ten meters from the roadway preventing the site from meeting siting criteria, however, air monitoring data are deemed representative of the neighborhood scale area due to the site deployment date, historical data, and low traffic count.

The following sites will be relocated at the request of the property owner.

- The TCEQ Austin Northwest site is temporarily decommissioned due to property owner construction; the site will be relocated approximately 0.10 miles to Austin North Hills Drive.

- The TCEQ Nederland High School site will be relocated due to property owner construction.

AMNP Appendix C lists Texas core based statistical areas (CBSAs) or metropolitan statistical areas (MSAs), 2018 U.S. Census Bureau population estimates, and required monitor counts. The TCEQ uses these data to evaluate the networks as documented in the AMNP. The U.S. Office of Management and Budget defined CBSAs and MSAs overlap in Texas, and the terms are used interchangeably in this assessment according to usage in the federal regulations.

Regulatory Network Review

Nitrogen Dioxide

The TCEQ nitrogen dioxide (NO_2) network includes nitrogen oxide (NO), NO_2, true NO_2, and total reactive nitrogen compound (NO_y) monitoring requirements. The TCEQ NO_2 network is designed to meet area-wide, Regional Administrator 40 (RA-40), near-road, PAMS, and NCore monitoring requirements. The TCEQ is required to operate 20 monitors that measure NO, NO_2, true NO_2, and NO_y and exceeds the requirements with 55 monitors that measure those pollutants. AMNP Appendix D lists the monitoring requirements for NO, NO_2, true NO_2, and NO_y in each Texas CBSA. AMNP Appendix B lists the air monitoring sites where NO, NO_2, true NO_2, and NO_y are measured.

Monitoring Requirements

Area-Wide Monitoring Requirements

Title 40 CFR §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 these sites be located in the areas with the highest expected NO_2 concentration that are also representative of a neighborhood or larger (urban) spatial scale. Title 40 CFR §58, Appendix D, Section 4.3.5 (3) and (4), define neighborhood scale monitoring as representative of ambient air concentrations in an area between 0.5 and 4.0 kilometers with relatively uniform land use. Urban scale monitoring is representative of ambient air concentrations over large portions of an urban area with dimensions between 4 and 50 kilometers.

Based on 2018 U.S. Census Bureau population estimates for Texas as noted in Appendix D, area-wide neighborhood or urban scale NO_2 monitoring is required in four Texas CBSAs. The NO_2 monitors at the following sites meet these area-wide requirements.

- Dallas-Fort Worth-Arlington (DFW) CBSA: Dallas Hinton
- Houston-The Woodlands-Sugar Land (Houston) CBSA: Clinton
- San Antonio-New Braunfels (San Antonio) CBSA: San Antonio Northwest
- Austin-Round Rock (Austin) CBSA: Austin Northwest

Regional Administrator Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 4.3.4 states that the EPA Regional Administrators collaborate with the states to designate a minimum of 40 NO_2

monitoring stations nationwide that are positioned to protect susceptible and vulnerable populations. The TCEQ collaborated with the EPA to identify the four Texas monitoring sites listed below to meet this requirement.

- DFW CBSA: Arlington Municipal Airport
- Houston CBSA: Clinton
- El Paso CBSA: Ascarate Park Southeast (SE)
- Beaumont-Port Arthur (Beaumont) CBSA: Nederland High School

Near-Road Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 4.3.2 requires one microscale near-road NO_2 monitor located near a major road with high annual average daily traffic counts in each CBSA with a population of 1,000,000 or more persons. An additional near-road monitor is required in each CBSA with a population of 2,500,000 or more persons. The TCEQ near-road monitoring network meets these requirements with the six current sites and one pending site listed below.

- DFW CBSA: Dallas LBJ Freeway and Fort Worth California Parkway North
- Houston CBSA: Houston Southwest Freeway and Houston North Loop
- San Antonio CBSA: San Antonio Interstate 35 and new site proposed in the AMNP Regulatory NO_2 Monitoring Network Changes section below
- Austin CBSA: Austin North Interstate 35

NCore and PAMS Monitoring Requirements

The TCEQ meets NCore monitoring requirements listed in 40 CFR §58, Appendix D, Section 3(b) with NO and NO_y measured at the NCore sites listed in Table 1.

The EPA revisions to the PAMS program under the final rule published October 26, 2015, and listed in 40 CFR §58, Appendix D, Section 5, require state agencies to collect and report NO, true NO_2, and NO_y measurements at NCore sites in CBSAs with 1,000,000 or more persons. The TCEQ meets the PAMS network monitoring requirements with hourly averaged NO, NO_2, and NO_y measured at the Dallas Hinton and Houston Deer Park number (#) 2 sites.

Table 1: National Core Multipollutant Monitoring Stations

Core Based Statistical Area	Site Name	2018 Population Estimates*	PAMS
Dallas-Fort Worth-Arlington	Dallas Hinton	7,539,711	Yes
Houston-The Woodlands-Sugar Land	Houston Deer Park #2	6,997,384	Yes
El Paso	El Paso Chamizal	845,553	No

*United States Census Bureau population estimates as of July 1, 2018.
– number
PAMS – Photochemical Assessment Monitoring Stations

Previously Recommended Changes

The TCEQ 2019 AMNP recommended changing the oxides of nitrogen (NO_x) monitor network designations for Camp Bullis, Eagle Mountain Lake, and Corsicana Airport from state initiative to special purpose monitors (SPM) supporting federal monitoring

objectives, at Keller from state-initiative to PAMS, and at Conroe Relocated and Dallas North #2 from SLAMS to PAMS. The TCEQ 2019 AMNP also recommended deploying a NO_x monitor to the new Houston West End site, named Houston Harvard Street. The EPA approved the requests in a letter dated November 4, 2019. The network designations changes were effective January 1, 2020, and the new Houston Harvard Street site monitor is expected to be operational soon.

The TCEQ changed the Floresville Hospital Boulevard and Karnes County NO_x monitors from state initiative to federal SPM, to support modeling and regional data analysis, effective January 1, 2020. The TCEQ Austin Northwest NO_x monitor was temporarily shut down on February 18, 2020, due to property owner construction. The air monitoring station and NO_x monitor will be permanently relocated approximately 0.10 miles to Austin North Hills Drive by July 31, 2020. The monitor designation changes and site relocation were approved by the EPA in a letter dated April 10, 2020.

Regulatory NO_2 Monitoring Network Changes

The TCEQ recommends deploying a second near-road monitoring station in the San Antonio MSA to meet the near-road requirement in CBSAs with 2,500,000 or more persons based on the latest available census figures. The TCEQ will explore possible new sites and propose a viable location adjacent to the highest possible ranked road segment by December 31, 2020, and deploy the site by December 31, 2021.

Sulfur Dioxide

The TCEQ sulfur dioxide (SO_2) network includes monitors sited to meet ambient SO_2 and high-sensitivity SO_2 monitoring requirements. The TCEQ SO_2 network is designed to meet the population weighted emissions index (PWEI) by CBSA, 2015 *Data Requirements Rule (DRR) for the 1-Hour Sulfur Dioxide Primary NAAQS*, and NCore monitoring requirements. The TCEQ is required to operate a total of 19 SO_2 monitors and exceeds the requirements with 31 monitors. A summary of the PWEI calculations, monitoring requirements, and current number of SO_2 monitors in each CBSA is shown in AMNP Appendix E. AMNP Appendix B lists the air monitoring sites where SO_2 is measured.

Monitoring Requirements

Population Weighted Emissions Index Requirements

Title 40 CFR §58, Appendix D, Section 4.4.2, requires states to establish an SO_2 monitoring network based on the PWEI calculations for Texas CBSAs. These indices are calculated by multiplying the CBSA population by the emissions inventory (EI) data for counties within that CBSA. The calculated values are divided by one million to obtain the CBSA PWEI. The PWEI monitoring requirements include the following.

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

The TCEQ used 2018 U.S. Census Bureau population estimates and 2017 National Emissions Inventory (NEI) data with 2018 TCEQ point-source EI data to calculate the PWEIs and to determine the minimum monitoring requirements for each CBSA. The TCEQ meets the PWEI requirements with six monitors as shown in AMNP Appendix E.

Data Requirements Rule (DRR) Requirements

Title 40 CFR §51.1205(b) (the DRR) required air agencies to characterize air quality around specified sources that emitted 2,000 tons per year (tpy) or more of SO_2 in the latest emissions inventory year (2014 for Texas). The TCEQ identified 24 sources for air quality characterization, including 16 sites identified for evaluation by monitoring. Per the DRR, 11 new SO_2 source-oriented monitors located near 13 sources were installed and operating by January 1, 2017. Details for the TCEQ's SO_2 source evaluation, modeling, and monitoring recommendations are in the TCEQ 2017 AMNP.

For seven SO_2 sources where the air quality was characterized by modeling actual SO_2 emissions, the DRR requires the TCEQ to submit an annual report that documents the annual emissions, provide an assessment of the cause of any emissions increase from the previous year, and make a recommendation regarding further modeling needs. The DRR-required assessment and recommendation are provided in AMNP Appendix F.

NCore Requirements

Title 40 CFR §58, Appendix D, Section 3 requires states to monitor SO_2 at NCore sites. The TCEQ meets this requirement with three high-sensitivity SO_2 monitors at the NCore sites listed in Table 1.

Previously Recommended Changes

The TCEQ 2019 AMNP recommended no changes to the SO_2 monitoring network; however, the Port Arthur 7th Street air monitoring station was relocated to a temporary location on July 23, 2019, due to property owner construction, and to a final location on December 13, 2019, with a new name, Port Arthur West 7th Street Gate 2. The new site was selected based on modeling conducted with updated facility operations and emissions. The EPA approved of the relocation in a letter dated August 23, 2019. The TCEQ Austin Northwest SO_2 monitor was temporarily shut down on February 18, 2020, due to property owner construction. The air monitoring station and SO_2 monitor will be permanently relocated approximately 0.10 miles to Austin North Hills Drive by July 31, 2020, approved by the EPA in a letter dated April 10, 2020.

The TCEQ Rockdale John D. Harper SO_2 monitor (and entire site) was decommissioned on June 5, 2020, due to sale/lease of the property. Per 40 CFR §51.1203(c)(3), this monitor was eligible for decommission based on a preliminary design value less than 50% of the 2010 SO_2 NAAQS from data collected during the first three-year period of operation. The facility requiring DRR SO_2 air quality characterization was shut down in 2017. The EPA approved of this change in a letter dated May 29, 2020.

Regulatory SO_2 Monitoring Network Changes

The TCEQ recommends decommissioning the Baytown Garth SO_2 monitor by December 31, 2020. To meet federal requirements, the TCEQ must operate a minimum of three SO_2 monitors in the Houston CBSA and currently operates five. The Baytown Garth SO_2 monitor data trends are among the lowest in the CBSA with a 2018 design value of 6 ppb, 8 percent (%) of the NAAQS. Air monitoring for SO_2 will continue in the Houston CBSA with four monitors; monitors are sited along the Houston ship channel and in

residential areas southeast and southwest of city center. The Baytown Garth site will continue to monitor for other pollutants as listed in AMNP Appendix B. The TCEQ recommends changing the Houston Croquet SO_2 monitor network designation from SPM to SLAMS to meet area PWEI requirements by January 1, 2021, and the Corsicana Airport SO_2 monitor from state initiative to federal SPM, effective January 1, 2021. Data from the Corsicana Airport monitor are currently submitted to the EPA Air Quality System database to support modeling and regional data analyses.

Lead

The TCEQ total suspended particulate (TSP) lead (Pb) network is designed to meet source-oriented SLAMS monitoring requirements. The TCEQ Pb monitoring network is required to operate three Pb monitors and exceeds this requirement with five monitors. AMNP Appendix G lists the Pb monitoring requirements and the total number of TSP Pb monitors. AMNP Appendix B lists the air monitoring sites where Pb is measured.

Monitoring Requirements

The TCEQ Pb network meets 40 CFR §58, Appendix D, Section 4.5 monitoring requirements. This section requires state agencies to conduct ambient air Pb monitoring near Pb sources that have been shown or are expected to contribute to a maximum ambient air Pb concentration in excess of the standard. Title 40 CFR §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 emitting 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.

The TCEQ evaluated the 2016, 2017, and 2018 point source EI data. All sources continue to maintain emissions below the 0.50 tpy threshold, except for the Lower Colorado River Authority Fayette Power Plant discussed below. Table 2 includes information regarding Pb source-oriented monitoring.

Table 2: 2016-2018 Lead Point Source Emissions Inventory Data

Facility Name	County	2016 Pb Emissions (tpy)	2017 Pb Emissions (tpy)	2018 Pb Emissions (tpy)	TCEQ Comments
Lower Colorado River Authority	Fayette	0.5580	0.6300	0.5793	Pb waiver renewal approved on October 26, 2015
Conecsus, LLC	Kaufman	0.3401	0.2617	0.2812	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

Pb Waivers

Under 40 CFR §58, Appendix D, Section 4.5(a)(ii), the EPA Regional Administrator may waive the requirement in 40 CFR §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 based on

historical monitoring data, modeling, or other approved means. All approved waivers must be renewed every five years as part of the network assessment required under 40 CFR §58.10(d).

Since 2010, the TCEQ has submitted five Pb waivers for source-oriented monitoring. The EPA Region 6 granted each request. Four of the waivers are no longer required due to a decrease in source emissions below the 0.50 tpy threshold. The remaining Pb waiver remains effective. The request to renew the Pb waiver for the Lower Colorado River Authority Fayette Power Plant in Fayette County was submitted in the 2015 TCEQ *Texas Five-Year Ambient Monitoring Network Assessment*. The waiver renewal request included information regarding a Pb modeling analysis indicating 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 the waiver renewal request in the TCEQ *2015 Annual Monitoring Network Plan* response letter dated October 26, 2015. Applicable waivers will be submitted for renewal in the 2020 TCEQ *Texas Five-Year Ambient Monitoring Network Assessment*.

Collocation Requirements

Title 40 CFR §58, Appendix A, Section 3.4.4 requires a primary quality assurance organization to select 15% of the Pb monitoring sites within the network for collocated quality control (QC) monitoring, with the first of these monitors measuring the highest Pb concentrations in the network. Based on the current network of primary Pb monitors, the TCEQ is required to maintain one collocated QC Pb monitor. The TCEQ operates collocated QC Pb monitors at Frisco Eubanks and Terrell Temtex. Terrell Temtex measured the highest 2018 network Pb concentrations.

Previously Recommended Changes

The TCEQ 2019 AMNP recommended reducing the sampling frequency of the Frisco Eubanks collocated QC Pb monitor to every 12th day. The EPA approved the request in a letter dated November 4, 2019, and the change was effective November 17, 2019.

Regulatory Pb Monitoring Network Changes

The TCEQ recommends decommissioning the TSP Pb monitors at El Paso UTEP and Ojo De Agua by December 31, 2020. The total 2018 El Paso County point source lead emissions of 0.06 tpy are well below the Pb monitoring threshold federal requirement of 0.50 tpy, and no single source in the area indicates the need for continued monitoring. The El Paso UTEP and Ojo De Agua monitors three-month rolling average design values are 0.02 micrograms per cubic meter ($\mu g/m^3$) and 0.00 $\mu g/m^3$, respectively, based on the most recent 38-months data. El Paso UTEP and Ojo De Agua will continue monitoring for other pollutants as listed in AMNP Appendix B.

Ozone

The TCEQ ozone (O_3) network is designed to meet SLAMS, PAMS, and NCore monitoring requirements. The TCEQ O_3 monitoring network is required to operate a total of 27 O_3 monitors and exceeds this requirement with 70 O_3 monitors. AMNP Appendix H lists the O_3 requirements and monitors in each MSA in the state. AMNP Appendix B lists the air monitoring sites where O_3 is measured.

Monitoring Requirements

SLAMS Requirements

Title 40 CFR §58, Appendix D, Section 4.1, requires O_3 monitoring in each MSA with a population of 350,000 or more persons. Monitoring is also required in MSAs with lower populations if the design value for that MSA is equal to or greater than 85% of the NAAQS. Monitoring requirements are outlined in Table 3. According to 2018 U.S. Census Bureau population estimates and 2016-2018 eight-hour O_3 design values, the TCEQ must operate a minimum of 24 O_3 monitors to meet SLAMS network requirements. AMNP Appendix B lists the monitors in each MSA.

Table 3: Ozone Monitoring Requirements

MSA Population[1]	Most recent 3-year design value concentrations ≥85% of any O_3 NAAQS[2]	Most recent 3-year design value concentrations <85% of any O_3 NAAQS[3, 4]
>10,000,000	4	2
4,000,000 to 10,000,000	3	1
350,000 to <4,000,000	2	1
50,000 to <350,000	1	0

[1]Minimum monitoring requirements apply to the metropolitan statistical area (MSA).
[2]The ozone (O_3) National Ambient Air Quality Standards (NAAQS) levels are defined in 40 CFR §50.
[3]These minimum monitoring requirements apply in the absence of a design value.
[4]MSA must contain an urbanized area of 50,000 or more population.
≥ - greater than or equal to
< - less than
> - greater than
% - percent

NCore and PAMS Requirements

In addition to SLAMS O_3 requirements, 40 CFR §58, Appendix D, Sections 3 and 5, require O_3 monitoring at NCore sites to meet NCore design criteria, and at NCore sites in CBSAs with a population of 1,000,000 or more persons to meet PAMS requirements. The TCEQ meets combined NCore and PAMS requirements with O_3 monitors at the three NCore sites listed in Table 1.

Previously Recommended Changes

The TCEQ 2019 AMNP recommended deploying O_3 SPM monitors to the Ojo De Agua air monitoring site and the new Houston West End site, named Houston Harvard Street. Both monitors are expected to be operational soon. The TCEQ proposed changing the network designation for the O_3 monitor at Corsicana Airport from state initiative to a federal SPM and changing the O_3 monitors at Dallas North #2, Cleburne Airport, and Keller to PAMS. The EPA approved the requests in a letter dated November 4, 2019, and the network designation changes were effective January 1, 2020.

The TCEQ Austin Northwest O_3 monitor was temporarily shut down on February 18, 2020, due to property owner construction. The air monitoring station and O_3 monitor will be permanently relocated approximately 0.10 miles to Austin North Hills Drive by July 31, 2020, as approved by the EPA in a letter dated April 10, 2020.

Regulatory O_3 Monitoring Network Changes

The TCEQ evaluated the current O_3 monitoring network and determined the existing O_3 network meets all federal monitoring requirements; therefore, no changes are recommended.

Carbon Monoxide

The TCEQ carbon monoxide (CO) network includes ambient CO and high-sensitivity CO monitoring. The TCEQ CO network is designed to meet NCore and near-road monitoring requirements. The agency is required to operate seven CO monitors and exceeds the requirements with 12: eight CO monitors and four high-sensitivity CO monitors. AMNP Appendix I lists the required and current CO monitors in each CBSA. AMNP Appendix B lists the air monitoring sites where CO is measured.

Monitoring Requirements

NCore Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 3 requires CO monitoring at NCore sites. The EPA's *Technical 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 technical recommendation with high-sensitivity CO monitors at the three NCore sites listed in Table 1.

Near-Road Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 4.2 requires collocating one CO monitor with one required near-road NO_2 monitor in CBSAs with populations of 1,000,000 or more persons. The TCEQ meets this requirement with CO monitors at the following near-road sites.

- DFW CBSA: Fort Worth California Parkway North
- Houston CBSA: Houston North Loop
- San Antonio CBSA: San Antonio Interstate 35
- Austin CBSA: Austin North Interstate 35

Previously Recommended Changes

The TCEQ 2019 AMNP recommended replacing the San Antonio Interstate 35 CO monitor with a high-sensitivity CO monitor. The EPA approved this request in a letter dated November 4, 2019. This monitor is expected to be operational soon.

Regulatory CO Monitoring Network Changes

The TCEQ evaluated the current CO monitoring network and determined the existing CO network meets all federal monitoring requirements; therefore, no changes are recommended.

Particulate Matter of 10 Micrometers or Less

The TCEQ particulate matter of 10 micrometers or less in diameter (PM_{10}) network is designed to meet SLAMS monitoring requirements based on MSA populations. The TCEQ is required to operate between 11 and 31 PM_{10} monitors and exceeds the minimum requirements with 21 monitors. AMNP Appendix J lists the required and current PM_{10} monitors in each MSA. AMNP Appendix B lists the air monitoring sites where PM_{10} is measured.

Monitoring Requirements

The TCEQ PM_{10} network is designed to meet the area requirements of 40 CFR §58, Appendix D, Section 4.6, specifying the number of PM_{10} monitors required in MSAs based on population and available measured concentrations. Monitoring requirements are listed in Table 4. Compliance with the PM_{10} standard is based on the number of measured exceedances of the 150 µg/m^3 standard averaged over three years. The evaluation of PM_{10} monitoring requirements was completed using 2018 U.S. Census Bureau population estimates and 2016-2018 PM_{10} data. The evaluation and the associated maximum 2016-2018 concentrations for each MSA are listed in AMNP Appendix J, Table 1.

Table 4: Particulate Matter of 10 Micrometers or Less Minimum Monitoring Requirements

Population Category	High Concentration[1]	Medium Concentration[2]	Low Concentration[3]
>1,000,000	6-10	4-8	2-4
500,000 to 1,000,000	4-8	2-4	1-2
250,000 to 500,000	3-4	1-2	0-1
100,000 to 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} National Ambient Air Quality Standards (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 §58, Appendix A, Section 3.3.4 requires a primary quality assurance organization to select 15% of the PM_{10} monitoring sites within the network for collocated QC sampling. At least 50% of the selected sites should have an annual mean particulate matter concentration among the highest in the network. AMNP Appendix J, Table 2 lists the maximum concentration measurement during the three-year period from 2016-2018 and includes the 2016, 2017, and 2018 annual mean concentrations for each PM_{10} site. The TCEQ evaluates the PM_{10} concentration data annually to ensure the PM_{10} collocated QC monitors continue to meet 40 CFR §58, Appendix A, Section 3.3.4.2. Based on the current network of PM_{10} samplers, the TCEQ is required to operate three PM_{10} collocated QC samplers and exceeds this requirement with four samplers. AMNP Appendix J, Table 1 lists the current collocated QC monitors.

The PM_{10} annual measured average concentration data were evaluated from 2016-2018 to determine network QC collocation sites. The PM_{10} measurement concentrations at Clinton, Socorro Hueco, and Ojo De Agua had 2018 annual mean concentrations among the highest in the network and continue to satisfy collocation QC requirements.

Previously Recommended Changes

The TCEQ 2019 AMNP recommended several PM_{10} changes that were approved by the EPA in a letter dated November 4, 2019. The TCEQ reduced the sampling frequency of collocated QC PM_{10} monitors at Clinton, Convention Center, Ojo De Agua, and Socorro Hueco to every 12th day, effective December 6, 2019. The TCEQ recommended adding a PM_{10} continuous federal equivalent method (FEM) monitor to Houston North Wayside by December 31, 2020. This monitor is expected to be operational soon.

As approved by the EPA in a letter dated August 1, 2018, the Riverside PM_{10} federal reference method (FRM) sampler was relocated to the El Paso Mimosa site, less than one mile from the original site, on December 17, 2019. The TCEQ relocated the Selma PM_{10} FRM monitor to the new San Antonio Bulverde Parkway site with a new site identification number on November 19, 2019, as approved by the EPA in a letter dated March 29, 2019. The Selma monitor and site were decommissioned on December 9, 2019.

The TCEQ will deploy a PM_{10} FRM sampler to the Dallas County southern sector industrial corridor by December 31, 2020. The new Dallas County southern sector air monitoring site will provide improved spatial coverage and air quality information.

Due to industrial and population growth in the Gregory-Portland area north of Corpus Christi, the TCEQ Monitoring Division, Toxicology Division, Air Quality Division, and TCEQ Corpus Christi Regional Office continue to evaluate the potential placement of PM_{10} monitors in San Patricio County, as previously recommended in the 2019 AMNP.

Regulatory PM_{10} Monitoring Network Changes

The TCEQ recommends decommissioning the Houston Westhollow PM_{10} FRM non-continuous sampler and replacing it with a continuous fine particulate matter monitor, as noted in the subsequent section, by December 31, 2020. This PM_{10} monitor had a 2018 annual average concentration <65% of the NAAQS and the Houston MSA will continue to have PM_{10} spatial coverage with four monitors. The particulate matter sampler resource reallocation allows the TCEQ to provide fine particulate matter data in west Houston.

The TCEQ recommends decommissioning the Edinburg East Freddy Gonzales Drive PM_{10} FRM sampler by December 31, 2020. This PM_{10} monitor had a 2018 annual average concentration <60% of the NAAQS. The McAllen-Mission-Edinburg MSA will continue to have PM_{10} spatial coverage with a monitor at Mission; PM_{10} data from Edinburg East Freddy Gonzales Drive and Mission correlate well.

Particulate Matter of 2.5 Micrometers or Less

The TCEQ particulate matter of 2.5 micrometers or less in diameter ($PM_{2.5}$) monitoring network includes a combination of non-continuous FRM, continuous FEM, and non-NAAQS comparable monitors designed to meet area, regional background, regional transport, NCore, and near-road network requirements. The TCEQ is required to operate 27 FRM, FEM, coarse particulate matter ($PM_{10\text{-}2.5}$), or speciated $PM_{2.5}$ monitors and exceeds the requirements with 68 monitors. An analysis of $PM_{2.5}$ monitoring and siting requirements using the most recent 2018 U.S. Census Bureau population estimates and 2018 $PM_{2.5}$ design values is provided in AMNP Appendix K. AMNP Appendix B lists the air monitoring sites where $PM_{2.5}$ is measured.

Monitoring Requirements

General and Continuous Monitoring Requirements

Title 40 CFR §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 equal or exceed 85% of the NAAQS. Monitoring requirements are outlined in Table 5. Under 40 CFR §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 FEM monitor. Additionally, 40 CFR §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. AMNP Appendix B lists monitors meeting the regional background and transport requirements.

Table 5: Particulate Matter of 2.5 Micrometers or Less Minimum Monitoring Requirements

MSA population	Most recent 3-year design value ≥85% of any $PM_{2.5}$ NAAQS	Most recent 3-year design value <85% of any $PM_{2.5}$ NAAQS
>1,000,000	3	2
500,000 to 1,000,000	2	1
50,000 to <500,000	1	0

< – less than
> – greater than
≥ – greater than or equal to
% - percent
MSA – metropolitan statistical area
NAAQS – National Ambient Air Quality Standards
$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter

NCore Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 3 requires $PM_{2.5}$ FRM mass, $PM_{2.5}$ FEM mass continuous, speciated $PM_{2.5}$, and $PM_{10-2.5}$ mass monitoring at all NCore sites. The TCEQ meets this requirement with $PM_{2.5}$ monitors at the three NCore sites listed in Table 1.

Near-Road $PM_{2.5}$ Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 4.7.1(b)(2) requires collocating one FRM or FEM $PM_{2.5}$ monitor with one required near-road NO_2 monitor in CBSAs with populations of 1,000,000 or more persons. The TCEQ meets this requirement with $PM_{2.5}$ monitors at the near-road sites listed below.

- DFW CBSA: Fort Worth California Parkway North
- Houston CBSA: Houston North Loop
- San Antonio CBSA: San Antonio Interstate 35
- Austin CBSA: Austin North Interstate 35

Collocation Requirements

Title 40 CFR §58, Appendix A, Section 3.2.3 requires a primary quality assurance organization to select 15% of the $PM_{2.5}$ primary monitors of each method designation (FRM or FEM) for collocated QC sampling. For each primary monitor designated as an FEM, 50% of the monitors designated for collocation shall be collocated with an FRM and 50% shall be collocated with a monitor having the same method designation as the FEM primary monitor (see Table 6). Fifty percent of the collocated QC 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 standard. Based on the current network of $PM_{2.5}$ FRM monitors, the TCEQ is required to operate two collocated $PM_{2.5}$ FRM (FRM/FRM collocation) monitors and meets this requirement with two monitors.

To replace aging $PM_{2.5}$ equipment, the TCEQ began deploying $PM_{2.5}$ continuous FEM monitors (method code 209) in 2017. Based on the current $PM_{2.5}$ network of 30 FEM monitors, the TCEQ is required to operate five collocated QC monitors pursuant to 40 CFR §58, Appendix A, Section 3.2.3.2(b). For the first collocation requirement, a primary $PM_{2.5}$ FEM monitor must be collocated with a $PM_{2.5}$ FRM monitor (FEM/FRM collocation). The second pair must have a $PM_{2.5}$ FEM monitor collocated with another $PM_{2.5}$ FEM monitor (FEM/FEM collocation). The remaining collocated pair requirements alternate from FEM/FRM to FEM/FEM collocation.

The TCEQ operates five $PM_{2.5}$ collocated QC monitor pairs, three $PM_{2.5}$ FEM/FRM monitor pairs, and two $PM_{2.5}$ FEM/FEM pairs. Information regarding the $PM_{2.5}$ collocation designations is listed in AMNP Appendix B. A summary of current approved and proposed collocation deployments are listed in Table 6.

Table 6: Particulate Matter of 2.5 Micrometers or Less FEM Quality Control Collocation Requirements

Number of Primary FEM Monitors (with unique method designation)	Number Collocated	Number Collocated with an FRM	Number Collocated with same Method Designation	Collocation Site and Method Designations
1-9	1	1	0	Austin Webberville Road FEM/FRM
10-16	2	1	1	Corpus Christi Huisache FEM/FEM
17-23	3	2	1	San Antonio Northwest FEM/FRM
24-29	4	2	2	Fort Worth California Parkway North FEM/FEM
30-36	5	3	2	Houston Aldine FEM/FRM
37-43	6	3	3	Mission* (FEM/FEM)

*Future planned deployment as collocation thresholds are met
FEM – federal equivalent method
FRM – federal reference method

Previously Recommended Changes

The TCEQ 2019 AMNP recommended several $PM_{2.5}$ changes that were approved by the EPA in a letter dated November 4, 2019. The El Paso Chamizal collocated QC $PM_{2.5}$ FRM monitor was decommissioned on December 12, 2019. The non-NAAQS comparable Houston Deer Park #2 $PM_{2.5}$ continuous tapered element oscillating microbalance (TEOM) sampler was decommissioned on December 6, 2019. The TCEQ deployed a $PM_{2.5}$ FEM monitor to Bryan Finfeather Road, on February 27, 2020 to expand network coverage in the College Station-Bryan MSA. The TCEQ discontinued the Houston Aldine $PM_{2.5}$ speciation on December 18, 2019. Reallocation of this $PM_{2.5}$ speciation monitor to the Clinton Drive site is expected to be operational soon. The TCEQ non-NAAQS

comparable $PM_{2.5}$ TEOM continuous monitor deployment to Houston North Wayside is expected to be operational soon.

The recommendation to relocate the Ascarate Park SE non-NAAQS comparable $PM_{2.5}$ TEOM to Ojo De Agua was not approved by the EPA. Air monitoring objectives require networks to be designed to provide information about peak air pollution levels in an area. Networks must include monitoring sites located to determine the highest concentration expected to occur in the areas covered by the network per 40 CFR §58, Appendix D Section 1.1.1. The Ojo De Agua $PM_{2.5}$ TEOM historically reflects the highest concentration for the El Paso area; therefore, the recommendation was not implemented.

As approved by the EPA in a letter dated March 20, 2019, the TCEQ relocated the Isla Blanca Park $PM_{2.5}$ non-NAAQS comparable monitor to the Isla Blanca State Park Road site as a $PM_{2.5}$ FEM continuous monitor, less than one mile from the original site, on October 7, 2019. As approved by the EPA in a letter dated January 15, 2020, the TCEQ decommissioned the San Antonio Palo Alto $PM_{2.5}$ continuous monitor on June 11, 2020, and relocated the site with a $PM_{2.5}$ FEM continuous monitor to the new Von Ormy Highway 16 site, on May 29, 2020.

The TCEQ Austin Northwest $PM_{2.5}$ monitor was temporarily shut down on February 18, 2020, due to property owner construction. The air monitoring station and $PM_{2.5}$ monitor will be permanently relocated approximately 0.10 miles to Austin North Hills Drive by July 31, 2020, as approved by the EPA in a letter dated April 10, 2020. The TCEQ will deploy a $PM_{2.5}$ non-NAAQS comparable monitor to the Dallas County southern sector industrial corridor by December 31, 2020. The Dallas County southern sector air monitoring site will provide improved spatial coverage and air quality information.

The TCEQ continues to replace aging $PM_{2.5}$ FRM non-continuous monitors and non-NAAQS comparable $PM_{2.5}$ continuous monitors ($PM_{2.5}$ TEOMs) with $PM_{2.5}$ FEM continuous monitors as indicated and approved in the 2018 and 2019 AMNPs. The approved changes status is listed in Table 7.

Table 7: Particulate Matter of 2.5 Micrometers or Less Summary of Approved Changes

Site Name	Monitor(s) Replaced	New Monitor	Action	Status
Bryan Finfeather Road	None – new area monitor	$PM_{2.5}$ FEM continuous	Deploy	Completed February 27, 2020
Denton Airport South	$PM_{2.5}$ TEOM	$PM_{2.5}$ FEM continuous	Method code change	Completed July 30, 2019
El Paso Chamizal	$PM_{2.5}$ FRM collocated QC	$PM_{2.5}$ FRM QC collocated	Decommission	Completed December 12, 2019
Isla Blanca State Park Road	$PM_{2.5}$ TEOM	$PM_{2.5}$ TEOM	Site relocation	Completed October 7, 2019
Fort Worth California Parkway North	$PM_{2.5}$ FRM	$PM_{2.5}$ FEM continuous collocated pair	Method code change, new FEM/FEM collocation pair	Completed July 31, 2019

Site Name	Monitor(s) Replaced	New Monitor	Action	Status
Fort Worth Northwest	$PM_{2.5}$ FRM	$PM_{2.5}$ FEM continuous	Method code change	Completed July 31, 2019
Haws Athletic Center	$PM_{2.5}$ FRM and $PM_{2.5}$ TEOM pair	$PM_{2.5}$ FEM continuous	Method code change	Completed December 4, 2019
Houston Aldine	$PM_{2.5}$ speciation	Decommission and relocate to Clinton	Decommission	Completed December 18, 2019
Von Ormy Highway 16	None	$PM_{2.5}$ continuous	Site deployment	Completed May 29, 2020
Palo Alto	$PM_{2.5}$ TEOM	Decommission, relocated to Von Ormy Highway 16	Decommission	Completed June 11, 2020
Austin Northwest	$PM_{2.5}$ TEOM	Replace with $PM_{2.5}$ FEM continuous	Method code change	Pending new site deployment
Clinton	$PM_{2.5}$ speciation	Deploy	Deploy	Pending
Conroe Relocated	$PM_{2.5}$ TEOM	$PM_{2.5}$ FEM continuous	Method code change	Pending
Convention Center	$PM_{2.5}$ FRM	$PM_{2.5}$ FEM continuous	Method code change	Pending
Corsicana Airport	$PM_{2.5}$ TEOM	$PM_{2.5}$ FEM continuous	Method code change	Pending
Dallas County southern sector	None – new area monitor	$PM_{2.5}$ TEOM	Deploy	Pending
Edinburg East Freddy Gonzalez	$PM_{2.5}$ FRM	Replace with $PM_{2.5}$ FEM continuous	Method code change	Pending
El Paso UTEP	$PM_{2.5}$ FRM and $PM_{2.5}$ TEOM pair	Replace with $PM_{2.5}$ FEM continuous	Method code change	Pending
Houston North Loop	$PM_{2.5}$ FRM	$PM_{2.5}$ FEM continuous	Method code change	Pending
Houston North Wayside	None – new site monitor	$PM_{2.5}$ TEOM	Deploy	Pending
Karnack	$PM_{2.5}$ FRM and $PM_{2.5}$ TEOM pair	Replace with $PM_{2.5}$ FEM continuous	Method code change	Pending
Kaufman	$PM_{2.5}$ TEOM	$PM_{2.5}$ FEM continuous	Method code change	Pending

Site Name	Monitor(s) Replaced	New Monitor	Action	Status
Seabrook Friendship Park	$PM_{2.5}$ TEOM	$PM_{2.5}$ FEM continuous	Method code change	Pending
Socorro Hueco	$PM_{2.5}$ TEOM	Replace with $PM_{2.5}$ FEM continuous	Method code change	Pending

FEM – federal equivalent method
FRM – federal reference method
NA – not applicable
$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter
QC – quality control
TEOM – tapered element oscillating microbalance
UTEP – University of Texas at El Paso

Regulatory $PM_{2.5}$ Monitoring Network Changes

The TCEQ recommends decreasing the Clinton and Houston Aldine collocated QC $PM_{2.5}$ FRM monitor's sampling frequency to 1-in-12 days, by December 31, 2020, as allowed by federal requirements. The TCEQ recommends aligning the Dona Park $PM_{2.5}$ speciation network affiliation from Chemical Speciation Network for Supplemental Speciation Stations to SPM, reflecting current data usage, by January 1, 2021. The TCEQ recommends deploying a $PM_{2.5}$ FEM continuous monitor to Houston Westhollow providing improved spatial coverage for west Houston by December 31, 2020.

The TCEQ continues to replace aging $PM_{2.5}$ non-NAAQS comparable equipment with new FEM technology to provide continuous NAAQS comparable data to the public that is suitable for Air Quality Index reporting and the EPA's AirNow webpage. The increase in NAAQS equivalent monitors optimizes the monitoring resources in affected MSAs. The TCEQ proposes to replace non-NAAQS comparable $PM_{2.5}$ continuous monitors ($PM_{2.5}$ TEOM) with $PM_{2.5}$ FEM continuous monitors by December 31, 2021, as listed in Table 8.

Table 8: Particulate Matter of 2.5 Micrometers or Less Recommendations and Method Code Changes

Site Name	Monitor to Change	Description	Current Method Code(s)	New Method Code	Estimated Date
Houston Westhollow	PM_{10}	Replace with $PM_{2.5}$ FEM continuous	NA	209	December 31, 2020
Ascarate Park Southeast	$PM_{2.5}$ TEOM	Replace with $PM_{2.5}$ FEM continuous	702*	209	December 31, 2021
Clinton	$PM_{2.5}$ TEOM	Replace with $PM_{2.5}$ FEM continuous	702*	209	December 31, 2021
Dona Park	$PM_{2.5}$ TEOM	Replace with $PM_{2.5}$ FEM continuous	702*	209	December 31, 2021
Midlothian OFW	$PM_{2.5}$ TEOM	Replace with $PM_{2.5}$ FEM continuous	702*	209	December 31, 2021

* - non-NAAQS comparable monitor
FEM – federal equivalent method
NA – not applicable

$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter
PM_{10} – particulate matter of 10 micrometers or less in diameter
TEOM – tapered element oscillating microbalance

Volatile Organic Compounds

The TCEQ volatile organic compound (VOC) network is designed to meet PAMS requirements. The TCEQ is required to operate two VOC monitors and exceeds this requirement with 12 monitors. The TCEQ VOC network includes eight automated gas chromatograph (autoGC) continuous monitors and four non-continuous canister samplers. AMNP Appendix L, Table 1 lists the required and current VOC monitors in each Texas CBSA. AMNP Appendix B lists the air monitoring sites where VOCs are measured.

Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 5 requires state agencies to collect hourly averaged speciated VOC data 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 exceeds VOC monitoring requirements with autoGCs at the three NCore sites listed in Table 1.

Previously Recommended Changes

The TCEQ 2019 AMNP recommended no changes to the VOC monitoring network.

Regulatory VOC Monitoring Network Changes

The TCEQ evaluated the current VOC monitoring network and determined the existing VOC network meets all federal monitoring requirements; therefore, no changes are recommended.

Carbonyls

The TCEQ carbonyl monitoring network is designed to meet PAMS requirements. The TCEQ is required to operate two carbonyl monitors and exceeds this requirement with four monitors. AMNP Appendix L, Table 2 lists the required and current carbonyl monitors in each Texas CBSA. AMNP Appendix B lists the air monitoring sites where carbonyls are measured.

Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 5, requires state agencies to collect three eight-hour averaged carbonyl samples every third day at each NCore site located in a CBSA with a population of 1,000,000 or more persons. The TCEQ currently collects carbonyl samples at the NCore sites listed below.

- DFW CBSA: Dallas Hinton
- Houston CBSA: Houston Deer Park #2

Previously Recommended Changes

The TCEQ 2019 AMNP recommended changing the network designation for the Fort Worth Northwest carbonyl monitor to PAMS. The EPA approved this change in a letter

dated November 4, 2019, and the network designation change was effective January 1, 2020.

Regulatory Carbonyl Monitoring Network Changes

The TCEQ evaluated the current carbonyl monitoring network and determined the existing carbonyl network meets all federal monitoring requirements; therefore, no changes are recommended.

Meteorology

The TCEQ meteorology monitoring network includes surface meteorology parameters (solar radiation, wind speed, wind direction, and temperature), upper air measurements (mixing height), and other meteorological parameters. Surface meteorology is measured at most air monitoring stations and additional meteorology parameters are required as PAMS measurements. All meteorology monitors in the TCEQ network are included in AMNP Appendix B.

Monitoring Requirements

Title 40 CFR §58, Appendix D, Section 5 requires state agencies to collect surface and upper air meteorology measurements at all NCore PAMS sites in CBSAs with a population of 1,000,000 or more persons. PAMS meteorology measurements include wind speed, wind direction, outdoor temperature, atmospheric pressure, relative humidity, precipitation, hourly averaged mixing-height, solar radiation, and ultraviolet radiation.

Previously Recommended Changes

The TCEQ 2019 AMNP recommended several meteorology changes that were approved by the EPA in a letter dated November 4, 2019. The Keller and Dallas North #2 wind speed, wind direction, outdoor temperature, and solar radiation monitors network designations were changed to PAMS on January 1, 2020. The TCEQ Corsicana Airport wind speed, wind direction, outdoor temperature, relative humidity, and dew point monitors were changed to federal SPM on January 1, 2020. The TCEQ Bryan Finfeather Road wind speed, wind direction, and outdoor temperature monitors were deployed on February 27, 2020. The TCEQ San Antonio Northwest ceilometer is pending deployment.

In addition to the changes recommended in the 2019 AMNP, the TCEQ deployed wind direction, wind speed, and outdoor temperature to the Terrell Temtex site on December 3, 2019. The Port Arthur 7th Street wind speed, wind direction, and outdoor temperature monitors were relocated to a temporary location on July 23, 2019, and to a final location on December 13, 2019, with a new name, Port Arthur West 7th Street Gate 2, as approved by the EPA in a letter dated August 23, 2019. The TCEQ Isla Blanca Park wind speed, wind direction, and outdoor temperature monitors were relocated to the new Isla Blanca State Park Road site on October 7, 2019, as approved by the EPA in a letter dated March 20, 2019. The TCEQ changed the Floresville Hospital Boulevard and Karnes County wind speed, wind direction, and outdoor temperature monitors from state initiative to federal SPM, effective January 1, 2020, to support modeling and regional data analyses, as approved by the EPA in a letter dated April 10, 2020. The TCEQ Rockdale John D. Harper wind speed, wind direction, and outdoor temperature

monitors (and entire site) were decommissioned on June 5, 2020, due to sale/lease of the property. The EPA approved of this change in a letter dated May 29, 2020.

As approved by the EPA in a letter dated January 15, 2020, the TCEQ decommissioned the San Antonio Palo Alto site including the wind speed, wind direction, and outdoor temperature monitors on June 11, 2020, and relocated the site with wind speed, wind direction, and outdoor temperature monitors to the new Von Ormy Highway 16 site, on May 29, 2020.

The TCEQ Austin Northwest wind speed, wind direction, and outdoor temperature monitors were temporarily shut down on February 18, 2020, due to property owner construction. The air monitoring station and the meteorological monitors will be relocated permanently approximately 0.10 miles to Austin North Hills Drive by July 31, 2020, as approved by the EPA in a letter dated April 10, 2020.

Regulatory Meteorology Monitoring Network Changes

The TCEQ proposes deploying wind speed, wind direction, and outdoor temperature to a second near-road monitoring station in the San Antonio MSA to meet the near-road requirement in CBSAs with 2,500,000 or more persons based on the latest available census figures by December 31, 2021.

Non-Regulatory Network Review

Semi-Volatile Organic Compounds

The TCEQ 2019 AMNP recommended to decommission the Socorro Hueco, Brownsville, and Mission SPM semi-volatile organic compound samplers. The EPA approved the recommendation in a letter dated November 4, 2019, and the monitors were decommissioned on September 1, 2019.

Conclusion

After consideration of the federal regulations, 2018 U.S. Census Bureau population data, and 2018 design values, the TCEQ will meet or exceed all monitoring requirements with the above-mentioned recommendations for the next calendar year.

Appendix A

2020 Summary of Proposed Network Changes

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix A: 2020 Summary of Proposed Network Changes

Air Monitoring Site Name	Proposed Action	Parameter(s)	Estimated Date
Austin Webberville	Waiver under 40 CFR §58, Appendix E, Section 10.1.1	Particulate matter	November 1, 2020
Nederland High School	Relocate site	All existing	December 31, 2021
San Antonio	Deploy second near-road site	NO_x, wind speed, wind direction, and outdoor temperature	December 31, 2021
El Paso UTEP	Decommission monitor	TSP Pb	December 31, 2020
Ojo De Agua	Decommission monitor	TSP Pb	December 31, 2020
Baytown Garth	Decommission monitor	SO_2	December 31, 2020
Corsicana Airport	Change network designation from state initiative to federal SPM	SO_2	January 1, 2021
Houston Croquet	Change network designation from SPM to SLAMS	SO_2	January 1, 2021
Edinburg East Freddy Gonzalez	Decommission monitor	PM_{10}	December 31, 2020
Houston Westhollow	Decommission monitor	PM_{10}	December 31, 2020
Houston Westhollow	Deploy SPM to existing site	$PM_{2.5}$ continuous	December 31, 2020
Dona Park	Change network designation from CSN Supplemental to SPM	$PM_{2.5}$ speciation	January 1, 2021
Ascarate Park Southeast	Replace non-NAAQS comparable monitor	$PM_{2.5}$ FEM continuous	December 31, 2021
Clinton	Replace non-NAAQS comparable monitor	$PM_{2.5}$ FEM continuous	December 31, 2021

Appendix A: 2020 Summary of Proposed Network Changes

Air Monitoring Site Name	Proposed Action	Parameter(s)	Estimated Date
Dona Park	Replace non-NAAQS comparable monitor	$PM_{2.5}$ FEM continuous	December 31, 2021
Midlothian OFW	Replace non-NAAQS comparable monitor	$PM_{2.5}$ FEM continuous	December 31, 2021
Clinton	Reduce sampling frequency to every 12th day	$PM_{2.5}$ QC collocated	December 31, 2020
Houston Aldine	Reduce sampling frequency to every 12th day	$PM_{2.5}$ QC collocated	December 31, 2020

AQS – EPA Air Quality System database
CSN - Chemical Speciation Network
EPA – United States Environmental Protection Agency
FEM – federal equivalent method
NAAQS – National Ambient Air Quality Standards
NO_x – oxides of nitrogen
PM_{10} – particulate matter of 10 micrometers or less in diameter
$PM_{2.5}$ – particulate matter of 2.5 micrometers or less in diameter
SPM – special purpose monitor
TSP Pb– total suspended particulate lead
UTEP – University of Texas at El Paso

Appendix B

Ambient Air Monitoring Network Site List

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Amarillo, TX	483751025	Amarillo 24th Avenue	4205 NE 24th Avenue, Amarillo	35.236736	-101.787405	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Amarillo, TX	483751025	Amarillo 24th Avenue	4205 NE 24th Avenue, Amarillo	35.236736	-101.787405	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Amarillo, TX	483751025	Amarillo 24th Avenue	4205 NE 24th Avenue, Amarillo	35.236736	-101.787405	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Amarillo, TX	483750320	Amarillo A&M	6500 Amarillo Blvd West, Amarillo	35.201592	-101.909275	Urban and Center City	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure	Urban Scale
Amarillo, TX	483751077	Amarillo Xcel El Rancho	Folsom Rd. & El Rancho Rd., Amarillo	35.316500	-101.741800	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Amarillo, TX	483751077	Amarillo Xcel El Rancho	Folsom Rd. & El Rancho Rd., Amarillo	35.316500	-101.741800	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Amarillo, TX	483751077	Amarillo Xcel El Rancho	Folsom Rd. & El Rancho Rd., Amarillo	35.316500	-101.741800	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Austin-Round Rock-Georgetown, TX	484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	30.483163	-97.875084	Rural	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	30.483163	-97.875084	Rural	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	30.483163	-97.875084	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Urban Scale
Austin-Round Rock-Georgetown, TX	484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	30.483163	-97.875084	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
Austin-Round Rock-Georgetown, TX	484530020	Austin Audubon Society	12200 Lime Creek Rd, Leander	30.483163	-97.875084	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Urban Scale
Austin-Round Rock-Georgetown, TX	484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	30.353860	-97.691660	Urban and Center City	CO	Near Road, SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
Austin-Round Rock-Georgetown, TX	484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	30.353860	-97.691660	Urban and Center City	NO/NO2/NOx	Near Road, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Microscale
Austin-Round Rock-Georgetown, TX	484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	30.353860	-97.691660	Urban and Center City	PM2.5 (Beta)	Near Road, SLAMS	Beta Attenuation	Continuous	Max Precursor Emissions Impact	Microscale
Austin-Round Rock-Georgetown, TX	484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	30.353860	-97.691660	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
Austin-Round Rock-Georgetown, TX	484531068	Austin North Interstate 35	8912 N IH 35 SVRD SB, Austin	30.353860	-97.691660	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Austin-Round Rock-Georgetown, TX	484530014	Austin Northwest	3724 North Hills Dr, Austin	30.354436	-97.760255	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Urban Scale
Austin-Round Rock-Georgetown, TX	484530014	Austin Northwest	3724 North Hills Dr, Austin	30.354436	-97.760255	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530014	Austin Northwest	3724 North Hills Dr, Austin	30.354436	-97.760255	Suburban	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530014	Austin Northwest	3724 North Hills Dr, Austin	30.354436	-97.760255	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Urban Scale
Austin-Round Rock-Georgetown, TX	484530014	Austin Northwest	3724 North Hills Dr, Austin	30.354436	-97.760255	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Austin-Round Rock-Georgetown, TX	484530014	Austin Northwest	3724 North Hills Dr, Austin	30.354436	-97.760255	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Austin-Round Rock-Georgetown, TX	484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	30.263204	-97.712891	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	30.263204	-97.712891	Urban and Center City	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	30.263204	-97.712891	Urban and Center City	PM2.5 (FRM)	QA Collocated SLAMS	Sequential FRM Gravimetric	24 Hours; 1/12 Days	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	30.263204	-97.712891	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Austin-Round Rock-Georgetown, TX	484530021	Austin Webberville Rd	2600B Webberville Rd, Austin	30.263204	-97.712891	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450009	Beaumont Downtown	1086 Vermont Avenue, Beaumont	30.036422	-94.071061	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
Beaumont-Port Arthur, TX	482450022	Hamshire	12552 Second St, Not In A City	29.863957	-94.317802	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	General Background; Regional Transport	Neighborhood, Urban Scale
Beaumont-Port Arthur, TX	482450022	Hamshire	12552 Second St, Not In A City	29.863957	-94.317802	Suburban	O3	SLAMS	UV Photometric	Continuous	General Background; Regional Transport	Urban Scale
Beaumont-Port Arthur, TX	482450022	Hamshire	12552 Second St, Not In A City	29.863957	-94.317802	Suburban	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450022	Hamshire	12552 Second St, Not In A City	29.863957	-94.317802	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482450022	Hamshire	12552 Second St, Not In A City	29.863957	-94.317802	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482450022	Hamshire	12552 Second St, Not In A City	29.863957	-94.317802	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482450018	Jefferson County Airport	End of 90th Street @ Jefferson County Airport, Port Arthur	29.942798	-94.000770	Suburban	Precipitation	PAMS, SLAMS	Rain Gauge	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482450018	Jefferson County Airport	End of 90th Street @ Jefferson County Airport, Port Arthur	29.942798	-94.000770	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482450018	Jefferson County Airport	End of 90th Street @ Jefferson County Airport, Port Arthur	29.942798	-94.000770	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	Barometric Pressure	PAMS, SLAMS	Barometric pressure transducer	Continuous	Max Precursor Emissions Impact	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	UV Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Beaumont-Port Arthur, TX	482451035	Nederland High School	1800 N. 18th Street, Nederland	29.978926	-94.010872	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
Beaumont-Port Arthur, TX	483611083	Orange 1st Street	2239 1st Street, Orange	30.153675	-93.725897	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	483611083	Orange 1st Street	2239 1st Street, Orange	30.153675	-93.725897	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	483611083	Orange 1st Street	2239 1st Street, Orange	30.153675	-93.725897	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482450021	Port Arthur Memorial School	2200 Jefferson Drive, Port Arthur	29.922894	-93.909018	Suburban	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450011	Port Arthur West	623 Ellias Street, Port Arthur	29.897516	-93.991084	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	482450011	Port Arthur West	623 Ellias Street, Port Arthur	29.897516	-93.991084	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	482450011	Port Arthur West	623 Ellias Street, Port Arthur	29.897516	-93.991084	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure; Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	482450011	Port Arthur West	623 Ellias Street, Port Arthur	29.897516	-93.991084	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	482450011	Port Arthur West	623 Ellias Street, Port Arthur	29.897516	-93.991084	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure; Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	482451071	Port Arthur West 7th Street Gate 2	West 7th Street, Valero Port Arthur Gate 2, Port Arthur	29.844200	-93.965200	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	482451071	Port Arthur West 7th Street Gate 2	West 7th Street, Valero Port Arthur Gate 2, Port Arthur	29.844200	-93.965200	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Beaumont-Port Arthur, TX	482451071	Port Arthur West 7th Street Gate 2	West 7th Street, Valero Port Arthur Gate 2, Port Arthur	29.844200	-93.965200	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Beaumont-Port Arthur, TX	482450101	SETRPC 40 Sabine Pass	5200 Mechanic, Not In A City	29.727931	-93.894081	Rural	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Ozone Concentration	Neighborhood
Beaumont-Port Arthur, TX	483611100	SETRPC 42 Mauriceville	Intersection of TX Hwys 62 & 12, Port Arthur	30.194558	-93.867237	Suburban	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Regional Transport; Upwind Background	Regional Scale
Beaumont-Port Arthur, TX	482450102	SETRPC 43 Jefferson Co Airport	Jefferson County Airport, Port Arthur	29.942751	-94.000684	Suburban	O3	SPM	UV Photometric	Continuous	Max Precursor Emissions Impact	Middle Scale
Beaumont-Port Arthur, TX	483611001	West Orange	2700 Austin Ave, West Orange	30.085263	-93.761341	Urban and Center City	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	483611001	West Orange	2700 Austin Ave, West Orange	30.085263	-93.761341	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Beaumont-Port Arthur, TX	483611001	West Orange	2700 Austin Ave, West Orange	30.085263	-93.761341	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	483611001	West Orange	2700 Austin Ave, West Orange	30.085263	-93.761341	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
Beaumont-Port Arthur, TX	483611001	West Orange	2700 Austin Ave, West Orange	30.085263	-93.761341	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Neighborhood
Big Spring, TX*	482271072	Big Spring Midway	1218 N. Midway Rd, Big Spring	32.280422	-101.407137	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Big Spring, TX*	482271072	Big Spring Midway	1218 N. Midway Rd, Big Spring	32.280422	-101.407137	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Big Spring, TX*	482271072	Big Spring Midway	1218 N. Midway Rd, Big Spring	32.280422	-101.407137	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Borger, TX*	482331073	Borger FM 1559	19440 FM 1559, Borger	35.676200	-101.440100	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Borger, TX*	482331073	Borger FM 1559	19440 FM 1559, Borger	35.676200	-101.440100	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Borger, TX*	482331073	Borger FM 1559	19440 FM 1559, Borger	35.676200	-101.440100	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Brownsville-Harlingen, TX	480610006	Brownsville	344 Porter Drive, Brownsville	25.892518	-97.493830	Urban and Center City	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Regional Scale
Brownsville-Harlingen, TX	480610006	Brownsville	344 Porter Drive, Brownsville	25.892518	-97.493830	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood
Brownsville-Harlingen, TX	480610006	Brownsville	344 Porter Drive, Brownsville	25.892518	-97.493830	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Brownsville-Harlingen, TX	480610006	Brownsville	344 Porter Drive, Brownsville	25.892518	-97.493830	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
Brownsville-Harlingen, TX	480611023	Harlingen Teege	1602 W Teege Avenue, Harlingen	26.200335	-97.712684	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Brownsville-Harlingen, TX	480611023	Harlingen Teege	1602 W Teege Avenue, Harlingen	26.200335	-97.712684	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Brownsville-Harlingen, TX	480611023	Harlingen Teege	1602 W Teege Avenue, Harlingen	26.200335	-97.712684	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Brownsville-Harlingen, TX	480612004	Isla Blanca State Park Road	Lot B 69 1/2, South Padre Island	26.071100	-97.157700	Rural	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Regional Transport	Urban Scale
Brownsville-Harlingen, TX	480612004	Isla Blanca State Park Road	Lot B 69 1/2, South Padre Island	26.071100	-97.157700	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Regional Transport	Regional Scale
Brownsville-Harlingen, TX	480612004	Isla Blanca State Park Road	Lot B 69 1/2, South Padre Island	26.071100	-97.157700	Rural	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Regional Scale
College Station-Bryan, TX	480411086	Bryan Finfeather Road	3670 Finfeather Road, <none>	30.628333	-96.362778	Rural	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure; Regional Transport	Neighborhood
College Station-Bryan, TX	480411086	Bryan Finfeather Road	3670 Finfeather Road, <none>	30.628333	-96.362778	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
College Station-Bryan, TX	480411086	Bryan Finfeather Road	3670 Finfeather Road, <none>	30.628333	-96.362778	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
College Station-Bryan, TX	483951076	Franklin Oak Grove	8127 Oak Grove Road, Franklin	31.168889	-96.481944	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
College Station-Bryan, TX	483951076	Franklin Oak Grove	8127 Oak Grove Road, Franklin	31.168889	-96.481944	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
College Station-Bryan, TX	483951076	Franklin Oak Grove	8127 Oak Grove Road, Franklin	31.168889	-96.481944	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Corpus Christi, TX	483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	27.804489	-97.431553	Urban and Center City	PM2.5 (Beta)	QA Collocated SLAMS	Beta Attenuation	Continuous	Quality Assurance	Neighborhood
Corpus Christi, TX	483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	27.804489	-97.431553	Urban and Center City	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	27.804489	-97.431553	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Highest Concentration; Population Exposure	Neighborhood
Corpus Christi, TX	483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	27.804489	-97.431553	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Middle Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Corpus Christi, TX	483550032	Corpus Christi Huisache	3810 Huisache Street, Corpus Christi	27.804489	-97.431553	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Middle Scale
Corpus Christi, TX	483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	27.832413	-97.555388	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	27.832413	-97.555388	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	27.832413	-97.555388	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
Corpus Christi, TX	483550026	Corpus Christi Tuloso	9860 La Branch, Corpus Christi	27.832413	-97.555388	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
Corpus Christi, TX	483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	27.765340	-97.434262	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	27.765340	-97.434262	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	27.765340	-97.434262	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	27.765340	-97.434262	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550025	Corpus Christi West	Corpus Christi State School (Airport Rd), 902 AIRPORT BLVD, Corpus Christi	27.765340	-97.434262	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Corpus Christi, TX	483550034	Dona Park	5707 Up River Rd, Corpus Christi	27.811817	-97.465703	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Corpus Christi, TX	483550034	Dona Park	5707 Up River Rd, Corpus Christi	27.811817	-97.465703	Urban and Center City	PM2.5 (Speciation)	CSN Supplemental, SLAMS	Carbons, Elements, Ions	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Corpus Christi, TX	483550034	Dona Park	5707 Up River Rd, Corpus Christi	27.811817	-97.465703	Urban and Center City	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Regional Transport	Neighborhood
Corpus Christi, TX	483550034	Dona Park	5707 Up River Rd, Corpus Christi	27.811817	-97.465703	Urban and Center City	PM2.5 FRM (with speciation)	CSN Supplemental, SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Corpus Christi, TX	483550034	Dona Park	5707 Up River Rd, Corpus Christi	27.811817	-97.465703	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Regional Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Corpus Christi, TX	483550034	Dona Park	5707 Up River Rd, Corpus Christi	27.811817	-97.465703	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Regional Scale
Corsicana, TX*	483491051	Corsicana Airport	Corsicana Airport, Corsicana	32.031934	-96.399141	Rural	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	General Background; Max Precursor Emissions Impact	Urban Scale
Corsicana, TX*	483491051	Corsicana Airport	Corsicana Airport, Corsicana	32.031934	-96.399141	Rural	O3	SPM	UV Photometric	Continuous	General Background; Max Ozone Concentration	Urban Scale
Corsicana, TX*	483491051	Corsicana Airport	Corsicana Airport, Corsicana	32.031934	-96.399141	Rural	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Source Oriented	Neighborhood
Corsicana, TX*	483491051	Corsicana Airport	Corsicana Airport, Corsicana	32.031934	-96.399141	Rural	Relative Humidity	SPM	Humidity Sensor	Continuous	General Background	Urban Scale
Corsicana, TX*	483491051	Corsicana Airport	Corsicana Airport, Corsicana	32.031934	-96.399141	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Urban Scale
Corsicana, TX*	483491051	Corsicana Airport	Corsicana Airport, Corsicana	32.031934	-96.399141	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Urban Scale
Corsicana, TX*	483491081	Richland Southeast 1220 Road	Southeast 1220 Road, Richland	31.904100	-96.352000	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Corsicana, TX*	483491081	Richland Southeast 1220 Road	Southeast 1220 Road, Richland	31.904100	-96.352000	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Corsicana, TX*	483491081	Richland Southeast 1220 Road	Southeast 1220 Road, Richland	31.904100	-96.352000	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	32.656370	-97.088591	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	32.656370	-97.088591	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	32.656370	-97.088591	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	32.656370	-97.088591	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393011	Arlington Municipal Airport	5504 South Collins Street, Arlington	32.656370	-97.088591	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	482510003	Cleburne Airport	1650 Airport Drive, Cleburne	32.353595	-97.436742	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
Dallas-Fort Worth-Arlington, TX	482510003	Cleburne Airport	1650 Airport Drive, Cleburne	32.353595	-97.436742	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	General Background	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	482510003	Cleburne Airport	1650 Airport Drive, Cleburne	32.353595	-97.436742	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	482510003	Cleburne Airport	1650 Airport Drive, Cleburne	32.353595	-97.436742	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130050	Convention Center	717 South Akard, Dallas	32.774262	-96.797686	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130050	Convention Center	717 South Akard, Dallas	32.774262	-96.797686	Urban and Center City	PM10 (FRM)	QA Collocated SLAMS	HiVol Gravimetric	24 Hours; 1/12 Days	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130050	Convention Center	717 South Akard, Dallas	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
Dallas-Fort Worth-Arlington, TX	481130050	Convention Center	717 South Akard, Dallas	32.774262	-96.797686	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130050	Convention Center	717 South Akard, Dallas	32.774262	-96.797686	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Barometric Pressure	PAMS, SLAMS	Barometric pressure transducer	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Carbonyl	PAMS, SLAMS	DNPH Silica HPLC	Days; Seasonal, 24 Hours 1/6	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	CO (High Sensitivity)	NCORE, SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	NO2 (Direct)	PAMS, SLAMS	Direct-Read NO2	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	NOy (High Sensitivity)	NCORE, PAMS, SLAMS	Chemi-luminescence	Continuous	Highest Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	O3	NCORE, PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	PM10-2.5	NCORE, SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	PM2.5 (Beta)	NCORE, SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	PM2.5 (FRM)	QA Collocated SLAMS	Sequential FRM Gravimetric	24 Hours; 1/12 Days	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	PM2.5 (FRM)	NCORE, SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	PM2.5 (Speciation)	CSN STN, NCORE, SLAMS	Elements, Ions, Sequential Non-FRM Gravimetric,	24 Hours; 1/3 Days	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Precipitation	PAMS, SLAMS	Rain Gauge	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Relative Humidity	NCORE, PAMS, SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	SO2 (High Sensitivity)	NCORE, SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Concentration; Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Concentration; Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	UV Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Visibility	SPM	Visibility Sensor	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481130069	Dallas Hinton	1415 Hinton Street, Dallas	32.820066	-96.860123	Urban and Center City	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	481131067	Dallas LBJ Freeway	8652 LBJ Freeway, Dallas	32.921180	-96.753550	Urban and Center City	NO/NO2/NOx	Near Road, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Microscale
Dallas-Fort Worth-Arlington, TX	481131067	Dallas LBJ Freeway	8652 LBJ Freeway, Dallas	32.921180	-96.753550	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
Dallas-Fort Worth-Arlington, TX	481131067	Dallas LBJ Freeway	8652 LBJ Freeway, Dallas	32.921180	-96.753550	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
Dallas-Fort Worth-Arlington, TX	481130075	Dallas North #2	12532 1/2 Nuestra Drive, Dallas	32.919206	-96.808498	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

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

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	481210034	Denton Airport South	Denton Airport South, Denton	33.219069	-97.196284	Rural	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Urban Scale
Dallas-Fort Worth-Arlington, TX	481210034	Denton Airport South	Denton Airport South, Denton	33.219069	-97.196284	Rural	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Urban Scale
Dallas-Fort Worth-Arlington, TX	484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	32.987891	-97.477175	Rural	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Urban Scale
Dallas-Fort Worth-Arlington, TX	484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	32.987891	-97.477175	Rural	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	32.987891	-97.477175	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Middle Scale
Dallas-Fort Worth-Arlington, TX	484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	32.987891	-97.477175	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Middle Scale
Dallas-Fort Worth-Arlington, TX	484390075	Eagle Mountain Lake	14290 Morris Dido Newark Rd, Eagle Mountain	32.987891	-97.477175	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Middle Scale
Dallas-Fort Worth-Arlington, TX	481130061	Earhart	3434 Bickers (Earhart Elem School), Dallas	32.785359	-96.876571	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391053	Fort Worth California Parkway North	1198 California Parkway North, <none>	32.664753	-97.337917	Urban and Center City	CO	Near Road, SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
Dallas-Fort Worth-Arlington, TX	484391053	Fort Worth California Parkway North	1198 California Parkway North, <none>	32.664753	-97.337917	Urban and Center City	NO/NO2/NOx	Near Road, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Microscale
Dallas-Fort Worth-Arlington, TX	484391053	Fort Worth California Parkway North	1198 California Parkway North, <none>	32.664753	-97.337917	Urban and Center City	PM2.5 (Beta)	Near Road, SLAMS	Beta Attenuation	Continuous	Population Exposure	Microscale
Dallas-Fort Worth-Arlington, TX	484391053	Fort Worth California Parkway North	1198 California Parkway North, <none>	32.664753	-97.337917	Urban and Center City	PM2.5 (Beta)	QA Collocated SLAMS	Beta Attenuation	Continuous	Quality Assurance	Microscale
Dallas-Fort Worth-Arlington, TX	484391053	Fort Worth California Parkway North	1198 California Parkway North, <none>	32.664753	-97.337917	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
Dallas-Fort Worth-Arlington, TX	484391053	Fort Worth California Parkway North	1198 California Parkway North, <none>	32.664753	-97.337917	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	Carbonyl	PAMS, SLAMS	DNPH Silica HPLC	24 Hours; Seasonal	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Middle Scale
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391002	Fort Worth Northwest	3317 Ross Ave, Fort Worth	32.805810	-97.356529	Urban and Center City	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
Dallas-Fort Worth-Arlington, TX	480850005	Frisco	6590 Hillcrest Road, Frisco	33.132400	-96.786419	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
Dallas-Fort Worth-Arlington, TX	480850005	Frisco	6590 Hillcrest Road, Frisco	33.132400	-96.786419	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	480850005	Frisco	6590 Hillcrest Road, Frisco	33.132400	-96.786419	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	480850005	Frisco	6590 Hillcrest Road, Frisco	33.132400	-96.786419	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	480850009	Frisco Eubanks	6601 Eubanks, Frisco	33.144662	-96.828809	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure; Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	480850009	Frisco Eubanks	6601 Eubanks, Frisco	33.144662	-96.828809	Suburban	TSP (Pb)	QA Collocated SLAMS	HiVol ICP-MS	24 Hours; 1/12 Days	Population Exposure; Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	480850009	Frisco Eubanks	6601 Eubanks, Frisco	33.144662	-96.828809	Suburban	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	480850009	Frisco Eubanks	6601 Eubanks, Frisco	33.144662	-96.828809	Suburban	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	480850029	Frisco Stonebrook	7202 Stonebrook Parkway, Frisco	33.136025	-96.824473	Suburban	TSP (Pb)	SPM	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	Barometric Pressure	PAMS, SLAMS	Barometric pressure transducer	Continuous	Max Ozone Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration; Max Ozone Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	Speciated VOC (Canister)	PAMS, SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Max Ozone Concentration; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	484393009	Grapevine Fairway	4100 Fairway Dr, Grapevine	32.984260	-97.063721	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	482311006	Greenville	824 Sayle Street, Greenville	33.153088	-96.115572	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure; Upwind Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	482311006	Greenville	824 Sayle Street, Greenville	33.153088	-96.115572	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure; Upwind Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	482311006	Greenville	824 Sayle Street, Greenville	33.153088	-96.115572	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	482311006	Greenville	824 Sayle Street, Greenville	33.153088	-96.115572	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	482311006	Greenville	824 Sayle Street, Greenville	33.153088	-96.115572	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	484391006	Haws Athletic Center	600 1/2 Congress St, Fort Worth	32.759154	-97.342332	Urban and Center City	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	Dew Point	SPM	Derived at site	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Upwind Background	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	O3	PAMS, SLAMS	UV Photometric	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	Speciated VOC (Canister)	PAMS, SLAMS	Canister GC-MS	24 Hours; 1/6 Days	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	UV Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481391044	Italy	900 FM 667 Ellis County, Italy	32.175417	-96.870189	Rural	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	482511008	Johnson County Luisa	2420 Luisa Ln, Alvarado	32.469701	-97.169271	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	482511008	Johnson County Luisa	2420 Luisa Ln, Alvarado	32.469701	-97.169271	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration	Neighborhood
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Population Exposure; Upwind Background	Neighborhood, Urban Scale
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Population Exposure; Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Upwind Background	Regional Scale
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure; Upwind Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Upwind Background	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	482570005	Kaufman	3790 S Houston St, Kaufman	32.564968	-96.317687	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Upwind Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	32.922492	-97.282099	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Urban Scale
Dallas-Fort Worth-Arlington, TX	484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	32.922492	-97.282099	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	32.922492	-97.282099	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	General Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	32.922492	-97.282099	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	General Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	484392003	Keller	FAA Site off Alta Vista Road, Fort Worth	32.922492	-97.282099	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	General Background	Urban Scale
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	PM2.5 (Speciation)	SPM	Carbons, Elements, Ions	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood, Regional Scale
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Regional Transport	Regional Scale
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	PM2.5 FRM (with speciation)	SPM	Sequential FRM Gravimetric	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Regional Scale
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	481390016	Midlothian OFW	2725 Old Fort Worth Road, Midlothian	32.482083	-97.026899	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	483670081	Parker County	3033 New Authon Rd, Weatherford	32.868773	-97.905931	Rural	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Dallas-Fort Worth-Arlington, TX	483670081	Parker County	3033 New Authon Rd, Weatherford	32.868773	-97.905931	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	483670081	Parker County	3033 New Authon Rd, Weatherford	32.868773	-97.905931	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	483670081	Parker County	3033 New Authon Rd, Weatherford	32.868773	-97.905931	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	481211032	Pilot Point	792 E Northside Dr, Pilot Point	33.410648	-96.944590	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Regional Scale
Dallas-Fort Worth-Arlington, TX	481211032	Pilot Point	792 E Northside Dr, Pilot Point	33.410648	-96.944590	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Upwind Background	Regional Scale
Dallas-Fort Worth-Arlington, TX	481211032	Pilot Point	792 E Northside Dr, Pilot Point	33.410648	-96.944590	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Upwind Background	Regional Scale
Dallas-Fort Worth-Arlington, TX	481211032	Pilot Point	792 E Northside Dr, Pilot Point	33.410648	-96.944590	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Upwind Background	Regional Scale
Dallas-Fort Worth-Arlington, TX	483970001	Rockwall Heath	100 E Heath St, Rockwall	32.936523	-96.459211	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	483970001	Rockwall Heath	100 E Heath St, Rockwall	32.936523	-96.459211	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	483970001	Rockwall Heath	100 E Heath St, Rockwall	32.936523	-96.459211	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	483970001	Rockwall Heath	100 E Heath St, Rockwall	32.936523	-96.459211	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Dallas-Fort Worth-Arlington, TX	482570020	Terrell Temtex	2988 Temtex Blvd, Terrell	32.731919	-96.317911	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Dallas-Fort Worth-Arlington, TX	482570020	Terrell Temtex	2988 Temtex Blvd, Terrell	32.731919	-96.317911	Rural	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure; Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	482570020	Terrell Temtex	2988 Temtex Blvd, Terrell	32.731919	-96.317911	Rural	TSP (Pb)	QA Collocated SLAMS	HiVol ICP-MS	24 Hours; 1/12 Days	Population Exposure; Source Oriented	Neighborhood
Dallas-Fort Worth-Arlington, TX	482570020	Terrell Temtex	2988 Temtex Blvd, Terrell	32.731919	-96.317911	Rural	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Eagle Pass, TX*	483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	28.704607	-100.451156	Urban and Center City	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Regional Transport	Regional Scale
Eagle Pass, TX*	483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	28.704607	-100.451156	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Regional Transport	Regional Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Eagle Pass, TX*	483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	28.704607	-100.451156	Urban and Center City	Visibility	SPM	Visibility Sensor	Continuous	Regional Transport	Regional Scale
Eagle Pass, TX*	483230004	Eagle Pass	265 Foster Maldonado, Eagle Pass	28.704607	-100.451156	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Regional Scale
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	Barometric Pressure	PAMS, SLAMS	Barometric pressure transducer	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration; Upwind Background	Urban Scale
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Highest Concentration; Upwind Background	Neighborhood, Urban Scale
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	Visibility	SPM	Visibility Sensor	Continuous	Highest Concentration; Population Exposure	Urban Scale
El Paso, TX	481410055	Ascarate Park SE	650 R E Thomason Loop, El Paso	31.746775	-106.402806	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration; Upwind Background	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	CO (High Sensitivity)	NCORE, SLAMS	Gas Filter Correlation	Continuous	Highest Concentration	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Concentration; Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Concentration; Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	NOy (High Sensitivity)	NCORE, SLAMS	Chemi-luminescence	Continuous	Highest Concentration	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	O3	NCORE, PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	PM10-2.5	NCORE, SLAMS	Beta Attenuation	Continuous	Highest Concentration; Population Exposure	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	PM2.5 (Beta)	NCORE, SLAMS	Beta Attenuation	Continuous	Highest Concentration; Population Exposure	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	PM2.5 (FRM)	NCORE, SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Highest Concentration; Population Exposure	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	PM2.5 (Speciation)	CSN STN, NCORE, SLAMS	Elements, Ions, Sequential Non-FRM Gravimetric,	24 Hours; 1/3 Days	Highest Concentration	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	SO2 (High Sensitivity)	NCORE, SLAMS	Pulsed Fluorescence	Continuous	Highest Concentration	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Concentration; Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Concentration; Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410044	El Paso Chamizal	800 S San Marcial Street, El Paso	31.765685	-106.455227	Urban and Center City	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
El Paso, TX	481410038	El Paso Mimosa	7501 Mimosa Avenue, El Paso	31.735857	-106.377909	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	CO	SPM	Gas Filter Correlation	Continuous	Highest Concentration	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/6 Days	General Background; Population Exposure	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Highest Concentration	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	Precipitation	PAMS, SLAMS	Rain Gauge	Continuous	Max Ozone Concentration	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	UV Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
El Paso, TX	481410037	El Paso UTEP	250 Rim Rd, El Paso	31.768287	-106.501243	Urban and Center City	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Neighborhood
El Paso, TX	481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	31.785769	-106.323578	Suburban	O3	SPM	UV Photometric	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	31.785769	-106.323578	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
El Paso, TX	481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	31.785769	-106.323578	Suburban	Relative Humidity	Border Grant, SLAMS	Humidity Sensor	Continuous	General Background	Neighborhood
El Paso, TX	481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	31.785769	-106.323578	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
El Paso, TX	481410029	Ivanhoe	10834 Ivanhoe (Ivanhoe Fire Station), El Paso	31.785769	-106.323578	Suburban	Wind	Border Grant, SLAMS	Anemometer | [020]SPOT READING	Continuous	General Background	Neighborhood
El Paso, TX	481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	31.862470	-106.547300	Suburban	CO	SLAMS	Gas Filter Correlation	Continuous	Population Exposure	Neighborhood
El Paso, TX	481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	31.862470	-106.547300	Suburban	PM10 (FRM)	QA Collocated SLAMS	HiVol Gravimetric	24 Hours; 1/12 Days	Population Exposure	Neighborhood
El Paso, TX	481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	31.862470	-106.547300	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
El Paso, TX	481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	31.862470	-106.547300	Suburban	TSP (Pb)	SLAMS	HiVol ICP-MS	24 Hours; 1/6 Days	Population Exposure	Neighborhood
El Paso, TX	481411021	Ojo De Agua	6767 Ojo De Agua, El Paso	31.862470	-106.547300	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410058	Skyline Park	5050A Yvette Drive, El Paso	31.893913	-106.425827	Suburban	O3	Border Grant, SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410058	Skyline Park	5050A Yvette Drive, El Paso	31.893913	-106.425827	Suburban	Temperature	Border Grant, SLAMS	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410058	Skyline Park	5050A Yvette Drive, El Paso	31.893913	-106.425827	Suburban	Wind	Border Grant, SLAMS	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	31.667500	-106.288000	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	31.667500	-106.288000	Suburban	PM10 (FRM)	Border Grant, SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	General Background; Population Exposure	Neighborhood
El Paso, TX	481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	31.667500	-106.288000	Suburban	PM10 (FRM)	Border Grant, QA Collocated, SLAMS	HiVol Gravimetric	24 Hours; 1/12 Days	Population Exposure	Neighborhood
El Paso, TX	481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	31.667500	-106.288000	Suburban	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	31.667500	-106.288000	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410057	Socorro Hueco	320 Old Hueco Tanks Road, El Paso	31.667500	-106.288000	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410693	Van Buren	2700 Harrison Avenue, El Paso	31.813370	-106.464520	Urban and Center City	PM10 (FRM)	SPM	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
El Paso, TX	481410693	Van Buren	2700 Harrison Avenue, El Paso	31.813370	-106.464520	Urban and Center City	Relative Humidity	SPM	Humidity Sensor	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410693	Van Buren	2700 Harrison Avenue, El Paso	31.813370	-106.464520	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
El Paso, TX	481410693	Van Buren	2700 Harrison Avenue, El Paso	31.813370	-106.464520	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Granbury, TX***	482210001	Granbury	200 N Gordon Street, Granbury	32.442304	-97.803529	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Granbury, TX***	482210001	Granbury	200 N Gordon Street, Granbury	32.442304	-97.803529	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Middle Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Granbury, TX***	482210001	Granbury	200 N Gordon Street, Granbury	32.442304	-97.803529	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Middle Scale
Granbury, TX***	482210001	Granbury	200 N Gordon Street, Granbury	32.442304	-97.803529	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482010058	Baytown	7210 1/2 Bayway Drive, Baytown	29.770698	-95.031232	Suburban	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010058	Baytown	7210 1/2 Bayway Drive, Baytown	29.770698	-95.031232	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010058	Baytown	7210 1/2 Bayway Drive, Baytown	29.770698	-95.031232	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	29.823345	-94.983870	Suburban	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	29.823345	-94.983870	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	29.823345	-94.983870	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	29.823345	-94.983870	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011017	Baytown Garth	8622 Garth Road Unit A, Baytown	29.823345	-94.983870	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	Dew Point	SPM	Derived at site	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Population Exposure	Middle Scale, Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010026	Channelview	1405 Sheldon Road, Channelview	29.802707	-95.125495	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Barometric Pressure	PAMS, SLAMS	Barometric pressure transducer	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Carbonyl	PAMS, SLAMS	DNPH Silica HPLC	24 Hours; Seasonal	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	CO (High Sensitivity)	SPM	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Highest Concentration; Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	PM10 (FRM)	QA Collocated SLAMS	HiVol Gravimetric	24 Hours; 1/12 Days	Highest Concentration; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/1 Days	Concentration; Population Exposure; Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	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
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Precipitation	SPM	Rain Gauge	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Concentration; Population Exposure; Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Concentration; Population Exposure; Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	UV Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011035	Clinton	9525 1/2 Clinton Dr, Houston	29.733726	-95.257593	Urban and Center City	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	483390078	Conroe Relocated	9472A Hwy 1484, Conroe	30.350302	-95.425128	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	General Background; Population Exposure	Urban Scale
Houston-The Woodlands-Sugar Land, TX	483390078	Conroe Relocated	9472A Hwy 1484, Conroe	30.350302	-95.425128	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	General Background; Population Exposure	Urban Scale
Houston-The Woodlands-Sugar Land, TX	483390078	Conroe Relocated	9472A Hwy 1484, Conroe	30.350302	-95.425128	Suburban	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	483390078	Conroe Relocated	9472A Hwy 1484, Conroe	30.350302	-95.425128	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	483390078	Conroe Relocated	9472A Hwy 1484, Conroe	30.350302	-95.425128	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	483390078	Conroe Relocated	9472A Hwy 1484, Conroe	30.350302	-95.425128	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	Dew Point	SPM	Derived at site	Continuous	General Background; Upwind Background	Middle Scale
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	General Background; Upwind Background	Middle Scale, Urban Scale
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Regional Transport	Regional Scale
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	481671034	Galveston 99th Street	9511 Avenue V 1/2, Galveston	29.254474	-94.861289	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	Barometric Pressure	PAMS, SLAMS	Barometric pressure transducer	Continuous	Max Ozone Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	NOy (High Sensitivity)	PAMS, SLAMS	Chemi-luminescence	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	O3	PAMS, SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	PM2.5 (FRM)	QA Collocated SLAMS	Sequential FRM Gravimetric	24 hours; 1/6 Days	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Max Ozone Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Ozone Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Max Ozone Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010024	Houston Aldine	4510 1/2 Aldine Mail Rd, Houston	29.901036	-95.326137	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Ozone Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	29.695729	-95.499219	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Middle Scale, Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	29.695729	-95.499219	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	29.695729	-95.499219	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	General Background; Max Precursor Emissions Impact	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	29.695729	-95.499219	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background; Max Precursor Emissions Impact	Middle Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	482010055	Houston Bayland Park	6400 Bissonnet Street, Houston	29.695729	-95.499219	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background; Max Precursor Emissions Impact	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482010051	Houston Croquet	13826 1/2 Croquet, Houston	29.623889	-95.474167	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010051	Houston Croquet	13826 1/2 Croquet, Houston	29.623889	-95.474167	Suburban	SO2	SPM	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010051	Houston Croquet	13826 1/2 Croquet, Houston	29.623889	-95.474167	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010051	Houston Croquet	13826 1/2 Croquet, Houston	29.623889	-95.474167	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Barometric Pressure	PAMS, SLAMS	Barometric pressure transducer	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Carbonyl	PAMS, SLAMS	DNPH Silica HPLC	Days; Seasonal, 24 Hours 1/6	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	CO (High Sensitivity)	NCORE, SLAMS	Gas Filter Correlation	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	NO2 (Direct)	PAMS, SLAMS	Direct-Read NO2	Continuous	Population Exposure; Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	NOy (High Sensitivity)	NCORE, PAMS, SLAMS	Chemi-luminescence	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	O3	NCORE, PAMS, SLAMS	UV Photometric	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	PM10-2.5	NCORE, SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	PM2.5 (Beta)	NCORE, SLAMS	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	PM2.5 (FRM)	NCORE, SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	PM2.5 (Speciation)	CSN STN, NCORE, SLAMS	Elements, Ions, Sequential Non-FRM Gravimetric,	24 Hours; 1/3 Days	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	PM2.5 (Speciation)	CSN STN, QA Collocated, SLAMS	Elements, Ions, Sequential Non-FRM Gravimetric, MET ONE	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Precipitation	PAMS, SLAMS	Rain Gauge	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Relative Humidity	NCORE, PAMS, SLAMS	Humidity Sensor	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	SO2 (High Sensitivity)	NCORE, SLAMS	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Speciated VOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Temperature	NCORE, PAMS, SLAMS	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	TNMOC (AutoGC)	PAMS, SLAMS	GC	Continuous	Max Precursor Emissions Impact; Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	UV Radiation	PAMS, SLAMS	Photovoltaic	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011039	Houston Deer Park #2	4514 1/2 Durant St, Deer Park	29.670025	-95.128508	Urban and Center City	Wind	NCORE, PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011034	Houston East	1262 1/2 Mae Drive, Houston	29.767997	-95.220582	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Highest Concentration; Population Exposure	Middle Scale, Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011034	Houston East	1262 1/2 Mae Drive, Houston	29.767997	-95.220582	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011034	Houston East	1262 1/2 Mae Drive, Houston	29.767997	-95.220582	Suburban	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011034	Houston East	1262 1/2 Mae Drive, Houston	29.767997	-95.220582	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482011034	Houston East	1262 1/2 Mae Drive, Houston	29.767997	-95.220582	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010060	Houston Kirkpatrick	5565 Kirkpatrick, Houston	29.807415	-95.293622	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	482010060	Houston Kirkpatrick	5565 Kirkpatrick, Houston	29.807415	-95.293622	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010062	Houston Monroe	9726 1/2 Monroe, Houston	29.625556	-95.267222	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010062	Houston Monroe	9726 1/2 Monroe, Houston	29.625556	-95.267222	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010062	Houston Monroe	9726 1/2 Monroe, Houston	29.625556	-95.267222	Suburban	Precipitation	SPM	Rain Gauge	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011052	Houston North Loop	822 North Loop, Houston	29.814530	-95.387690	Urban and Center City	CO	Near Road, SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
Houston-The Woodlands-Sugar Land, TX	482011052	Houston North Loop	822 North Loop, Houston	29.814530	-95.387690	Urban and Center City	NO/NO2/NOx	Near Road, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Microscale
Houston-The Woodlands-Sugar Land, TX	482011052	Houston North Loop	822 North Loop, Houston	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
Houston-The Woodlands-Sugar Land, TX	482011052	Houston North Loop	822 North Loop, Houston	29.814530	-95.387690	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
Houston-The Woodlands-Sugar Land, TX	482011052	Houston North Loop	822 North Loop, Houston	29.814530	-95.387690	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
Houston-The Woodlands-Sugar Land, TX	482010046	Houston North Wayside	7330 1/2 North Wayside, Houston	29.828086	-95.284096	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011066	Houston Southwest Freeway	5617 Westward Avenue, Houston	29.721600	-95.492650	Urban and Center City	NO/NO2/NOx	Near Road, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Microscale
Houston-The Woodlands-Sugar Land, TX	482011066	Houston Southwest Freeway	5617 Westward Avenue, Houston	29.721600	-95.492650	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
Houston-The Woodlands-Sugar Land, TX	482011066	Houston Southwest Freeway	5617 Westward Avenue, Houston	29.721600	-95.492650	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
Houston-The Woodlands-Sugar Land, TX	482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	29.723333	-95.635833	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	29.723333	-95.635833	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	29.723333	-95.635833	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010066	Houston Westhollow	3333 1/2 Hwy 6 South, Houston	29.723333	-95.635833	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	482011043	La Porte Airport C243	La Porte Airport, 2434 Buchanan Street, La Porte	29.672000	-95.064700	Suburban	Precipitation	PAMS, SLAMS	Rain Gauge	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011043	La Porte Airport C243	La Porte Airport, 2434 Buchanan Street, La Porte	29.672000	-95.064700	Suburban	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011043	La Porte Airport C243	La Porte Airport, 2434 Buchanan Street, La Porte	29.672000	-95.064700	Suburban	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	29.043759	-95.472946	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure; Source Oriented	Middle Scale, Neighborhood
Houston-The Woodlands-Sugar Land, TX	480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	29.043759	-95.472946	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure; Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	29.043759	-95.472946	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Middle Scale
Houston-The Woodlands-Sugar Land, TX	480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	29.043759	-95.472946	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Middle Scale
Houston-The Woodlands-Sugar Land, TX	480391016	Lake Jackson	109B Brazoria Hwy 332 West, Lake Jackson	29.043759	-95.472946	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482010047	Lang	4401 1/2 Lang Rd, Houston	29.834167	-95.489167	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Middle Scale, Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010047	Lang	4401 1/2 Lang Rd, Houston	29.834167	-95.489167	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010047	Lang	4401 1/2 Lang Rd, Houston	29.834167	-95.489167	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011015	Lynchburg Ferry	4364 Independence Parkway South, Baytown	29.758889	-95.079444	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Source Oriented	Middle Scale, Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011015	Lynchburg Ferry	4364 Independence Parkway South, Baytown	29.758889	-95.079444	Suburban	O3	SLAMS	UV Photometric	Continuous	Source Oriented	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482011015	Lynchburg Ferry	4364 Independence Parkway South, Baytown	29.758889	-95.079444	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011015	Lynchburg Ferry	4364 Independence Parkway South, Baytown	29.758889	-95.079444	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011015	Lynchburg Ferry	4364 Independence Parkway South, Baytown	29.758889	-95.079444	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
Houston-The Woodlands-Sugar Land, TX	480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	29.520443	-95.392509	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	29.520443	-95.392509	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
Houston-The Woodlands-Sugar Land, TX	480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	29.520443	-95.392509	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	480391004	Manvel Croix Park	4503 Croix Pkwy, Manvel	29.520443	-95.392509	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010029	Northwest Harris County	16822 Kitzman, Tomball	30.039524	-95.673951	Rural	Dew Point	SPM	Derived at site	Continuous	Source Oriented	Microscale
Houston-The Woodlands-Sugar Land, TX	482010029	Northwest Harris County	16822 Kitzman, Tomball	30.039524	-95.673951	Rural	NO/NO2/NOx	PAMS, SLAMS	Chemi-luminescence	Continuous	Extreme Downwind; Population Exposure; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010029	Northwest Harris County	16822 Kitzman, Tomball	30.039524	-95.673951	Rural	O3	PAMS, SLAMS	UV Photometric	Continuous	Extreme Downwind; Population Exposure; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010029	Northwest Harris County	16822 Kitzman, Tomball	30.039524	-95.673951	Rural	Relative Humidity	PAMS, SLAMS	Humidity Sensor	Continuous	Extreme Downwind; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010029	Northwest Harris County	16822 Kitzman, Tomball	30.039524	-95.673951	Rural	Solar Radiation	PAMS, SLAMS	Photovoltaic	Continuous	Extreme Downwind; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010029	Northwest Harris County	16822 Kitzman, Tomball	30.039524	-95.673951	Rural	Temperature	PAMS, SLAMS	Aspirated Thermister	Continuous	Extreme Downwind; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010029	Northwest Harris County	16822 Kitzman, Tomball	30.039524	-95.673951	Rural	Wind	PAMS, SLAMS	Potentiometer Cup Anemometer	Continuous	Extreme Downwind; Upwind Background	Urban Scale
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	Barometric Pressure	SPM	Barometric pressure transducer	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	Dew Point	SPM	Derived at site	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	O3	SPM	UV Photometric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	Precipitation	SPM	Rain Gauge	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	Relative Humidity	SPM	Humidity Sensor	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	SO2	SPM	Pulsed Fluorescence	Continuous	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	UV Radiation	SPM	Photovoltaic	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482010416	Park Place	7421 Park Place Blvd, Houston	29.686389	-95.294722	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	29.583047	-95.015544	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Middle Scale, Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	29.583047	-95.015544	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Houston-The Woodlands-Sugar Land, TX	482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	29.583047	-95.015544	Suburban	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	Highest Concentration	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	29.583047	-95.015544	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	29.583047	-95.015544	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Middle Scale
Houston-The Woodlands-Sugar Land, TX	482011050	Seabrook Friendship Park	4522 Park Rd, Seabrook	29.583047	-95.015544	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Middle Scale
Houston-The Woodlands-Sugar Land, TX	480710013	Smith Point Hawkins Camp	1850 Hawkins Camp Rd, Anahuac	29.546244	-94.786969	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	480710013	Smith Point Hawkins Camp	1850 Hawkins Camp Rd, Anahuac	29.546244	-94.786969	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Neighborhood
Houston-The Woodlands-Sugar Land, TX	481670004	Texas City Fire Station	2516 Texas Avenue, Texas City	29.384444	-94.930833	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Highest Concentration	Neighborhood
Killeen-Temple-Fort Hood, TX	480271047	Killeen Skylark Field	1605 Stone Tree Drive, Killeen	31.088002	-97.679734	Urban and Center City	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	General Background	Urban Scale
Killeen-Temple-Fort Hood, TX	480271047	Killeen Skylark Field	1605 Stone Tree Drive, Killeen	31.088002	-97.679734	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
Killeen-Temple-Fort Hood, TX	480271047	Killeen Skylark Field	1605 Stone Tree Drive, Killeen	31.088002	-97.679734	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
Killeen-Temple-Fort Hood, TX	480271047	Killeen Skylark Field	1605 Stone Tree Drive, Killeen	31.088002	-97.679734	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Killeen-Temple-Fort Hood, TX	480271045	Temple Georgia	8406 Georgia Avenue, Temple	31.122419	-97.431052	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Urban Scale
Killeen-Temple-Fort Hood, TX	480271045	Temple Georgia	8406 Georgia Avenue, Temple	31.122419	-97.431052	Suburban	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure	Urban Scale
Killeen-Temple-Fort Hood, TX	480271045	Temple Georgia	8406 Georgia Avenue, Temple	31.122419	-97.431052	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Killeen-Temple-Fort Hood, TX	480271045	Temple Georgia	8406 Georgia Avenue, Temple	31.122419	-97.431052	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Kingsville, TX*	482730314	National Seashore	20420 Park Road, Corpus Christi	27.426981	-97.298692	Rural	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Regional Transport	Regional Scale
Kingsville, TX*	482730314	National Seashore	20420 Park Road, Corpus Christi	27.426981	-97.298692	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Regional Transport	Regional Scale
Kingsville, TX*	482730314	National Seashore	20420 Park Road, Corpus Christi	27.426981	-97.298692	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Regional Scale
Laredo, TX	484790017	Laredo Bridge	700 Zaragosa St, Laredo	27.501826	-99.502984	Urban and Center City	PM10 (FRM)	Border Grant, SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Highest Concentration	Microscale
Laredo, TX	484790017	Laredo Bridge	700 Zaragosa St, Laredo	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
Laredo, TX	484790017	Laredo Bridge	700 Zaragosa St, Laredo	27.501826	-99.502984	Urban and Center City	Temperature	Border Grant, SLAMS	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Laredo, TX	484790017	Laredo Bridge	700 Zaragosa St, Laredo	27.501826	-99.502984	Urban and Center City	Wind	Border Grant, SLAMS	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Laredo, TX	484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	27.517456	-99.515222	Suburban	CO	Border Grant, SLAMS	Gas Filter Correlation	Continuous	Population Exposure	Neighborhood
Laredo, TX	484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	27.517456	-99.515222	Suburban	O3	Border Grant, SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Laredo, TX	484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	27.517456	-99.515222	Suburban	PM10 (FRM)	Border Grant, SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
Laredo, TX	484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	27.517456	-99.515222	Suburban	Temperature	Border Grant, SLAMS	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
Laredo, TX	484790016	Laredo Vidaurri	2020 Vidaurri Ave, Laredo	27.517456	-99.515222	Suburban	Wind	Border Grant, SLAMS, Spm	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
Laredo, TX	484790313	World Trade Bridge	Mines Road 11601 FM 1472, Laredo	27.599444	-99.533333	Suburban	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Source Oriented	Microscale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Longview, TX	481830001	Longview	Gregg Co Airport near Longview, Longview	32.378696	-94.711813	Rural	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	Population Exposure	Neighborhood
Longview, TX	481830001	Longview	Gregg Co Airport near Longview, Longview	32.378696	-94.711813	Rural	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Longview, TX	481830001	Longview	Gregg Co Airport near Longview, Longview	32.378696	-94.711813	Rural	Precipitation	SPM	Rain Gauge	Continuous	General Background	Neighborhood
Longview, TX	481830001	Longview	Gregg Co Airport near Longview, Longview	32.378696	-94.711813	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	General Background; Population Exposure	Neighborhood
Longview, TX	481830001	Longview	Gregg Co Airport near Longview, Longview	32.378696	-94.711813	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Neighborhood
Longview, TX	481830001	Longview	Gregg Co Airport near Longview, Longview	32.378696	-94.711813	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Longview, TX	481830001	Longview	Gregg Co Airport near Longview, Longview	32.378696	-94.711813	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Longview, TX	484011082	Tatum CR 2181d Martin Creek Lake	9515 County Road 2181d, Tatum	32.277930	-94.570851	Rural	SO2	SPM	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Longview, TX	484011082	Tatum CR 2181d Martin Creek Lake	9515 County Road 2181d, Tatum	32.277930	-94.570851	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Longview, TX	484011082	Tatum CR 2181d Martin Creek Lake	9515 County Road 2181d, Tatum	32.277930	-94.570851	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Lubbock, TX	483031028	Lubbock 12th Street	3901 East 12th Street, Lubbock	33.585530	-101.786980	Urban and Center City	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure	Urban Scale
Lubbock, TX	483031028	Lubbock 12th Street	3901 East 12th Street, Lubbock	33.585530	-101.786980	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Regional Scale
Lubbock, TX	483031028	Lubbock 12th Street	3901 East 12th Street, Lubbock	33.585530	-101.786980	Urban and Center City	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Regional Scale
Marshall, TX*	482031079	Hallsville Red Oak Road	9206 Red Oak Road, Hallsville	32.470228	-94.481596	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Marshall, TX*	482031079	Hallsville Red Oak Road	9206 Red Oak Road, Hallsville	32.470228	-94.481596	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Marshall, TX*	482031079	Hallsville Red Oak Road	9206 Red Oak Road, Hallsville	32.470228	-94.481596	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	General Background	Regional Scale, Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	O3	SLAMS	UV Photometric	Continuous	General Background	Regional Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	PM2.5 (FRM)	SPM	Sequential FRM Gravimetric	24 Hours; 1/6 Days	General Background	Regional Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	PM2.5 (Speciation)	CSN Supplemental, SLAMS	Elements, Ions, Sequential Non-FRM Gravimetric,	24 Hours; 1/3 Days	General Background; Regional Transport	Regional Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	PM2.5 (TEOM)[N]	SPM	TEOM Gravimetric	Continuous	General Background	Regional Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Urban Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Urban Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	Visibility	SPM	Visibility Sensor	Continuous	General Background	Urban Scale
Marshall, TX*	482030002	Karnack	Hwy 134 & Spur 449, Not In A City	32.669002	-94.167468	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Urban Scale
McAllen-Edinburg-Mission, TX	482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	26.288622	-98.152066	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Regional Scale
McAllen-Edinburg-Mission, TX	482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	26.288622	-98.152066	Urban and Center City	PM2.5 (FRM)	SLAMS	Sequential FRM Gravimetric	24 Hours; 1/3 Days	Population Exposure	Regional Scale
McAllen-Edinburg-Mission, TX	482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	26.288622	-98.152066	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Regional Scale
McAllen-Edinburg-Mission, TX	482151046	Edinburg East Freddy Gonzalez Drive	1491 East Freddy Gonzalez Drive, Edinburg	26.288622	-98.152066	Urban and Center City	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Regional Scale
McAllen-Edinburg-Mission, TX	482150043	Mission	2300 North Glasscock, Mission	26.226210	-98.291069	Suburban	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
McAllen-Edinburg-Mission, TX	482150043	Mission	2300 North Glasscock, Mission	26.226210	-98.291069	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Urban Scale
McAllen-Edinburg-Mission, TX	482150043	Mission	2300 North Glasscock, Mission	26.226210	-98.291069	Suburban	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Urban Scale
McAllen-Edinburg-Mission, TX	482150043	Mission	2300 North Glasscock, Mission	26.226210	-98.291069	Suburban	Solar Radiation	SPM	Photovoltaic	Continuous	Population Exposure	Microscale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
McAllen-Edinburg-Mission, TX	482150043	Mission	2300 North Glasscock, Mission	26.226210	-98.291069	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Microscale
McAllen-Edinburg-Mission, TX	482150043	Mission	2300 North Glasscock, Mission	26.226210	-98.291069	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Microscale
Mount Pleasant, TX*	484491078	Cookville FM 4855	385 CR 4855, Not In A City	33.075200	-94.847400	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
Mount Pleasant, TX*	484491078	Cookville FM 4855	385 CR 4855, Not In A City	33.075200	-94.847400	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Mount Pleasant, TX*	484491078	Cookville FM 4855	385 CR 4855, Not In A City	33.075200	-94.847400	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
none	480430101	Bravo Big Bend	Big Bend National Park, Big Bend Nat Park	29.302552	-103.177908	Rural	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	General Background	Regional Scale
none	480430101	Bravo Big Bend	Big Bend National Park, Big Bend Nat Park	29.302552	-103.177908	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Microscale
none	480430101	Bravo Big Bend	Big Bend National Park, Big Bend Nat Park	29.302552	-103.177908	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Regional Scale
none	481611084	Fairfield FM 2570 Ward Ranch	488 FM 2570, Fairfield	31.797813	-96.076294	Rural	SO2	SPM	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
none	481611084	Fairfield FM 2570 Ward Ranch	488 FM 2570, Fairfield	31.797813	-96.076294	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Source Oriented	Neighborhood
none	481611084	Fairfield FM 2570 Ward Ranch	488 FM 2570, Fairfield	31.797813	-96.076294	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Neighborhood
none	482551070	Karnes County	1100B East Main Avenue, Karnes City	28.880440	-97.888065	Rural	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	Max Precursor Emissions Impact; Upwind Background	Urban Scale
none	482551071	Karnes County	1100B East Main Avenue, Karnes City	28.880440	-97.888065	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
none	482551072	Karnes County	1100B East Main Avenue, Karnes City	28.880440	-97.888065	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Odessa, TX	481351014	Odessa Gonzales	2700 Disney, Odessa	31.870259	-102.334746	Suburban	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Highest Concentration	Regional Scale
Odessa, TX	481351014	Odessa Gonzales	2700 Disney, Odessa	31.870259	-102.334746	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Odessa, TX	481351014	Odessa Gonzales	2700 Disney, Odessa	31.870259	-102.334746	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
San Antonio-New Braunfels, TX	480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	29.275381	-98.311692	Rural	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Source Oriented; Upwind Background	Urban Scale
San Antonio-New Braunfels, TX	480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	29.275381	-98.311692	Rural	O3	SLAMS	UV Photometric	Continuous	Source Oriented; Upwind Background	Urban Scale
San Antonio-New Braunfels, TX	480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	29.275381	-98.311692	Rural	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure; Source Oriented	Urban Scale
San Antonio-New Braunfels, TX	480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	29.275381	-98.311692	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Population Exposure; Source Oriented	Neighborhood
San Antonio-New Braunfels, TX	480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	29.275381	-98.311692	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Source Oriented	Urban Scale
San Antonio-New Braunfels, TX	480290059	Calaveras Lake	14620 Laguna Rd, San Antonio	29.275381	-98.311692	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Source Oriented	Urban Scale
San Antonio-New Braunfels, TX	480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	29.632058	-98.564936	Rural	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Urban Scale
San Antonio-New Braunfels, TX	480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	29.632058	-98.564936	Rural	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Urban Scale
San Antonio-New Braunfels, TX	480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	29.632058	-98.564936	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Urban Scale
San Antonio-New Braunfels, TX	480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	29.632058	-98.564936	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Urban Scale
San Antonio-New Braunfels, TX	480290052	Camp Bullis	F Range (1000Yd marker off Wilderness Trail), Near Wilderness Rd, San Antonio	29.632058	-98.564936	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Urban Scale
San Antonio-New Braunfels, TX	484931038	Floresville Hospital Boulevard	1404 Hospital Blvd, Floresville	29.130700	-98.148100	Rural	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	Max Precursor Emissions Impact; Upwind Background	Urban Scale
San Antonio-New Braunfels, TX	484931038	Floresville Hospital Boulevard	1404 Hospital Blvd, Floresville	29.130700	-98.148100	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Urban Scale
San Antonio-New Braunfels, TX	484931038	Floresville Hospital Boulevard	1404 Hospital Blvd, Floresville	29.130700	-98.148100	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Urban Scale
San Antonio-New Braunfels, TX	480290060	Frank Wing Municipal Court	401 South Frio St, San Antonio	29.422194	-98.505419	Urban and Center City	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Middle Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
San Antonio-New Braunfels, TX	480290677	Old Hwy 90	911 Old Hwy 90 West, San Antonio	29.423937	-98.580511	Urban and Center City	PM2.5 (TEOM)[N]	SPM	1405 TEOM Gravimetric (178)	Continuous	Population Exposure	Neighborhood
San Antonio-New Braunfels, TX	480291087	San Antonio Bulverde Parkway	3843 Bulverde Parkway, <none>	29.635000	-98.417700	Suburban	PM10 (FRM)	SLAMS	HiVol Gravimetric	24 Hours; 1/6 Days	Population Exposure	Neighborhood
San Antonio-New Braunfels, TX	480291087	San Antonio Bulverde Parkway	3843 Bulverde Parkway, <none>	29.635000	-98.417700	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Neighborhood
San Antonio-New Braunfels, TX	480291087	San Antonio Bulverde Parkway	3843 Bulverde Parkway, <none>	29.635000	-98.417700	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Neighborhood
San Antonio-New Braunfels, TX	480291080	San Antonio Gardner Road	7145 Gardner Road, San Antonio	29.352911	-98.332814	Suburban	SO2	SLAMS	Pulsed Fluorescence	Continuous	Source Oriented	Neighborhood
San Antonio-New Braunfels, TX	480291080	San Antonio Gardner Road	7145 Gardner Road, San Antonio	29.352911	-98.332814	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
San Antonio-New Braunfels, TX	480291080	San Antonio Gardner Road	7145 Gardner Road, San Antonio	29.352911	-98.332814	Suburban	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
San Antonio-New Braunfels, TX	480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	29.529432	-98.391403	Urban and Center City	CO	Near Road, SLAMS	Gas Filter Correlation	Continuous	Max Precursor Emissions Impact	Microscale
San Antonio-New Braunfels, TX	480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	29.529432	-98.391403	Urban and Center City	NO/NO2/NOx	Near Road, SLAMS	Chemi-luminescence	Continuous	Max Precursor Emissions Impact	Microscale
San Antonio-New Braunfels, TX	480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	29.529432	-98.391403	Urban and Center City	PM2.5 (Beta)	Near Road, SLAMS	Beta Attenuation	Continuous	Max Precursor Emissions Impact	Microscale
San Antonio-New Braunfels, TX	480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	29.529432	-98.391403	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Max Precursor Emissions Impact	Microscale
San Antonio-New Braunfels, TX	480291069	San Antonio Interstate 35	9904 IH 35 N, San Antonio	29.529432	-98.391403	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Max Precursor Emissions Impact	Microscale
San Antonio-New Braunfels, TX	480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	29.515090	-98.620166	Suburban	NO/NO2/NOx	SLAMS	Chemi-luminescence	Continuous	Population Exposure	Neighborhood
San Antonio-New Braunfels, TX	480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	29.515090	-98.620166	Suburban	O3	SLAMS	UV Photometric	Continuous	Max Ozone Concentration; Population Exposure	Urban Scale
San Antonio-New Braunfels, TX	480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	29.515090	-98.620166	Suburban	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
San Antonio-New Braunfels, TX	480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	29.515090	-98.620166	Suburban	PM2.5 (FRM)	QA Collocated SLAMS	Sequential FRM Gravimetric	24 Hours; 1/12 Days	Quality Assurance	Urban Scale
San Antonio-New Braunfels, TX	480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	29.515090	-98.620166	Suburban	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Urban Scale
San Antonio-New Braunfels, TX	480290032	San Antonio Northwest	6655 Bluebird Lane, San Antonio	29.515090	-98.620166	Suburban	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Urban Scale
San Antonio-New Braunfels, TX	480131090	Von Ormy Highway 16	17534 North State Highway 16, Von Ormy	29.162997	-98.589158	Rural	PM2.5 (Beta)	SPM	Beta Attenuation	Continuous	Population Exposure; Source Oriented	Microscale
San Antonio-New Braunfels, TX	480131090	Von Ormy Highway 16	17535 North State Highway 16, Von Ormy	29.162997	-98.589158	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
San Antonio-New Braunfels, TX	480131090	Von Ormy Highway 16	17536 North State Highway 16, Von Ormy	29.162997	-98.589158	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Texarkana, TX-Texarkana, AR	480371031	Texarkana New Boston	2700 New Boston Rd, Texarkana	33.436111	-94.077780	Urban and Center City	PM2.5 (Beta)	SLAMS	Beta Attenuation	Continuous	Population Exposure	Urban Scale
Texarkana, TX-Texarkana, AR	480371031	Texarkana New Boston	2700 New Boston Rd, Texarkana	33.436111	-94.077780	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Population Exposure	Urban Scale
Texarkana, TX-Texarkana, AR	480371031	Texarkana New Boston	2700 New Boston Rd, Texarkana	33.436111	-94.077780	Urban and Center City	Wind (3m)	SPM	Potentiometer Cup Anemometer	Continuous	Population Exposure	Urban Scale
Tyler, TX	484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	32.344027	-95.415755	Rural	NO/NO2/NOx	SPM	Chemi-luminescence	Continuous	General Background	Urban Scale
Tyler, TX	484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	32.344027	-95.415755	Rural	O3	SLAMS	UV Photometric	Continuous	General Background	Urban Scale
Tyler, TX	484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	32.344027	-95.415755	Rural	Precipitation	SPM	Rain Gauge	Continuous	General Background	Neighborhood
Tyler, TX	484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	32.344027	-95.415755	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	General Background	Neighborhood
Tyler, TX	484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	32.344027	-95.415755	Rural	Temperature	SPM	Aspirated Thermister	Continuous	General Background	Neighborhood
Tyler, TX	484230007	Tyler Airport Relocated	14790 County Road 1145, Tyler	32.344027	-95.415755	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	General Background	Neighborhood
Victoria, TX	484690003	Victoria	106 Mockingbird Lane, Victoria	28.836214	-97.005526	Urban and Center City	O3	SLAMS	UV Photometric	Continuous	Population Exposure	Neighborhood
Victoria, TX	484690003	Victoria	106 Mockingbird Lane, Victoria	28.836214	-97.005526	Urban and Center City	Solar Radiation	SPM	Photovoltaic	Continuous	Highest Concentration	Neighborhood

Appendix B: Ambient Air Monitoring Network Site List

Texas MSA CBSA	AQS Site Number	Site Name	Address Location	Latitude	Longitude	Location Setting	Sampler Type	AQS Network Type	Methods	Operating Schedule	Monitoring Objective	Spatial Scale
Victoria, TX	484690003	Victoria	106 Mockingbird Lane, Victoria	28.836214	-97.005526	Urban and Center City	Temperature	SPM	Aspirated Thermister	Continuous	Highest Concentration	Neighborhood
Victoria, TX	484690003	Victoria	106 Mockingbird Lane, Victoria	28.836214	-97.005526	Urban and Center City	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Highest Concentration	Neighborhood
Waco, TX	483091037	Waco Mazanec	4472 Mazanec Rd, Waco	31.653086	-97.070704	Rural	CO	SLAMS	Gas Filter Correlation	Continuous	Upwind Background	Urban Scale
Waco, TX	483091037	Waco Mazanec	4472 Mazanec Rd, Waco	31.653086	-97.070704	Rural	O3	SLAMS	UV Photometric	Continuous	Upwind Background	Regional Scale
Waco, TX	483091037	Waco Mazanec	4472 Mazanec Rd, Waco	31.653086	-97.070704	Rural	PM2.5 (TEOM)[N]	SPM	1405 TEOM Gravimetric (178)	Continuous	Regional Transport	Regional Scale
Waco, TX	483091037	Waco Mazanec	4472 Mazanec Rd, Waco	31.653086	-97.070704	Rural	SO2	SLAMS	Pulsed Fluorescence	Continuous	Upwind Background	Urban Scale
Waco, TX	483091037	Waco Mazanec	4472 Mazanec Rd, Waco	31.653086	-97.070704	Rural	Solar Radiation	SPM	Photovoltaic	Continuous	Regional Transport	Urban Scale
Waco, TX	483091037	Waco Mazanec	4472 Mazanec Rd, Waco	31.653086	-97.070704	Rural	Temperature	SPM	Aspirated Thermister	Continuous	Regional Transport	Urban Scale
Waco, TX	483091037	Waco Mazanec	4472 Mazanec Rd, Waco	31.653086	-97.070704	Rural	Wind	SPM	Potentiometer Cup Anemometer	Continuous	Regional Transport	Urban Scale

Appendix B: Ambient Air Monitoring Network Site List

Symbol/Acronym	Description
*	Micropolitan Statistical Area
**	County is not a Metropolitan or Micropolitan Statistical Area
***	Granbury, Texas, is not a Metropolitan Statistical Area on the US Census Bureaus' list, but is designated as such in AQS, Granbury, Texas is located in Hood County, Texas and in the Dallas-Fort Worth-Arlington MSA
N	Monitor is not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in 40 Code of Federal 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
3 8-Hours; 1/3 Days (Jun - Aug)	8 3-Hour Samples, Once every Third Day from June through August
24-Hour; 1/6 Days	1 24-Hour Sample, Once every Sixth Day
AMNP	Annual Monitoring Network Plan
AQS	Air Quality System
AR	Arkansas
AutoGC	automated gas chromatograph
Border	The Border network designation is part of the SLAMS network for monitors within 100 kilometers of the United States/Mexico border.
CBSA	core based statistical area
CSN STN	Chemical Speciation Network Speciation Trends Network site (includes NCore monitors/requirements, samples analyzed by EPA contracted laboratory)
CSN Supplemental	Chemical Speciation Network supplemental speciation site (samples analyzed by TCEQ contracted laboratory)
CO	carbon monoxide
FM	Farm-to-Market
FRM	federal reference method
GC-MS	gas chromatograph mass spectrometry
Hi-Vol	High-Volume
Hwy	Highway
IH	Interstate Highway
MSA	metropolitan statistical area/micropolitan statistical area
NCore	National Core Multipollutant Monitoring Stations
NO_2	nitrogen dioxide
$NO/NO_2/NO_x$	nitrogen oxides
NO_y	total reactive nitrogen
O_3	ozone
OFW	Old Fort Worth

Appendix B: Ambient Air Monitoring Network Site List

Symbol/Acronym	Description
PAMS	Photochemical Assessment Monitoring Stations
PM_{10}	particulate matter of 10 micrometers or less in diameter
$PM_{10-2.5}$	coarse particulate matter
$PM_{2.5}$	particulate matter of 2.5 micrometers or less in diameter
QA Collocated	quality assurance collocated monitor
SE	southeast
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
SVOC	semi-volatile organic compound
TCEQ	Texas Commission on Environmental Quality
TEOM	tapered element oscillating microbalance (not NAAQS comparable)
TSP (Pb)	total suspended particulate (lead)
TX	Texas
VOC	volatile organic compound
Wind	All wind sampler types produce data for parameters 61101, 61103, 61104, 61105, and 61106.

Appendix C

Population and Criteria Pollutant Monitor Status by Metropolitan Statistical Area

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix C: Population and Criteria Pollutant Monitor Status by Metropolitan Statistical Area[6]

Texas Metropolitan Statistical Area	2018 Population Estimate[2]	NO_2 and NO/NO_y Required[5]	NO_2 and NO/NO_y Existing[1,5]	SO_2 Required[5]	SO_2 Existing[1,5]	Pb Required[1]	Pb Existing[1]	O_3 Required	O_3 Existing	CO Required[5]	CO Existing[1,5]	PM_{10} Required[1]	PM_{10} Existing[1]	$PM_{2.5}$ Required[1]	$PM_{2.5}$ Existing[1]
Dallas-Fort Worth-Arlington	7,539,711	6	17	2	3	3	3	4	19	2	2	2-4	2	7	13
Houston-The Woodlands-Sugar Land	6,997,384	6	19	3	5	0	0	4	20	2	3	2-4	5	8	13
San Antonio-New Braunfels	2,518,036	3	4	2	2	0	0	2	3	1	1	2-4	2	3	5
Austin-Round Rock	2,168,316	2	2	0	1	0	0	2	2	1	1	2-4	2	2	3
McAllen-Edinburg-Mission	865,939	0	0	0	0	0	0	1	1	0	0	1-2	2	2	2
El Paso	845,553	2	4	1	1	0	2	3	6	1	3	2-4	5	5	8
Corpus Christi	452,950	0	0	0	3	0	0	2	2	0	0	0-1	1	0	4
Killeen-Temple	451,679	0	1	0	0	0	0	2	2	0	0	0-1	0	0	1
Brownsville-Harlingen	423,908	0	0	0	0	0	0	1	1	0	0	0-1	0	0	2
Beaumont-Port Arthur	409,526	1	4	3	4	0	0	2	7	0	0	0-1	0	0	3
Lubbock	319,068	0	0	0	0	0	0	0	0	0	0	0-1	0	0	1
Laredo	275,910	0	0	0	0	0	0	0	1	0	1	0-1	2	0	1
Waco	271,942	0	0	0	1	0	0	1	1	0	1	0-1	0	0	1
Amarillo	265,947	0	0	1	2	0	0	0	0	0	0	0-1	0	0	1
College Station-Bryan	262,431	0	0	1	1	0	0	0	0	0	0	0-1	0	0	1
Tyler	230,221	0	1	0	0	0	0	1	1	0	0	0	0	0	0
Longview	219,417	0	1	1	2	0	0	1	1	0	0	0	0	0	0
Midland	178,331	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Abilene	171,451	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odessa	162,124	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wichita Falls	151,306	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Texarkana	150,242	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sherman-Denison	133,991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Angelo	119,711	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Victoria	99,619	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Marshall[3]	66,726	0	1	1	1	0	0	0	1	0	0	0	0	0	3
Eagle Pass[3]	58,485	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Corsicana[3]	49,565	0	1	1	1	0	0	0	1	0	0	0	0	0	1
Big Spring[3]	37,847	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Mount Pleasant[3]	33,033	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Kingsville[3]	31,571	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Borger[3]	21,198	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Karnes County[4]	not available	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Freestone County[4]	not available	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Big Bend National Park[4]	not available	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals[3]		**20**	**55**	**19**	**31**	**3**	**5**	**27**	**70**	**7**	**12**	**11-31**	**21**	**27**	**68**

[1]Individual monitors may fulfill multiple requirements and are only counted once. Collocated quality control monitors are not included in totals.
[2]United States Census Bureau population estimates as of July 1, 2018, link below
[3]Area is classified as a micropolitan statistical area and not subject to SLAMS requirements.
[4]Area not classified as a metropolitan or micropolitan statistical area, county population data is not applicable.
[5]Required and existing counts include NO_y, high-sensitivity SO_2, and high-sensitivity CO monitors.
[6]Planned required monitor deployment is discussed in the applicable AMNP section.
https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

CO - carbon monoxide
NO_2 and NO/NO_y - nitrogen dioxide, nitrogen oxide, and total reactive nitrogen compounds
Pb - lead
PM_{10} - particulate matter of 10 micrometers or less
$PM_{2.5}$ - particulate matter of 2.5 micrometers or less
O_3 - ozone
SO_2 - sulfur dioxide

Appendix D

Nitrogen Dioxide, Nitrogen Oxide, and Total Reactive Nitrogen Monitor Status

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix D: Nitrogen Dioxide, Nitrogen Oxide, and Total Reactive Nitrogen Monitor Status

Core Based Statistical Areas	2018 Population Estimate[1]	Required NO_2 Area-Wide Monitors	Required NO_2 RA-40 Monitors	Required NO_2 Near-Road Monitors	Required True NO_2 PAMS Monitors	Required NO/NO_y PAMS/NCore Monitors	Total Required NO_2 and NO/NO_y Monitors	Total Existing NO_2 and NO/NO_y Monitors[2]
Dallas-Fort Worth-Arlington	7,539,711	1	1	2	1	1	6	17
Houston-The Woodlands-Sugar Land	6,997,384	1	1	2	1	1	6	19
San Antonio-New Braunfels	2,518,036	1	0	2	0	0	3	4
Austin-Round Rock	2,168,316	1	0	1	0	0	2	2
McAllen-Edinburg-Mission	865,939	0	0	0	0	0	0	0
El Paso	845,553	0	1	0	0	1	2	4
Corpus Christi	452,950	0	0	0	0	0	0	0
Killeen-Temple	451,679	0	0	0	0	0	0	1
Brownsville-Harlingen	423,908	0	0	0	0	0	0	0
Beaumont-Port Arthur	409,526	0	1	0	0	0	1	4
Lubbock	319,068	0	0	0	0	0	0	0
Laredo	275,910	0	0	0	0	0	0	0
Waco	271,942	0	0	0	0	0	0	0
Amarillo	265,947	0	0	0	0	0	0	0
College Station-Bryan	262,431	0	0	0	0	0	0	0
Tyler	230,221	0	0	0	0	0	0	1
Longview	219,417	0	0	0	0	0	0	1
Midland	178,331	0	0	0	0	0	0	0
Abilene	171,451	0	0	0	0	0	0	0
Odessa	162,124	0	0	0	0	0	0	0
Wichita Falls	151,306	0	0	0	0	0	0	0
Texarkana	150,242	0	0	0	0	0	0	0
Sherman-Denison	133,991	0	0	0	0	0	0	0
San Angelo	119,711	0	0	0	0	0	0	0
Victoria	99,619	0	0	0	0	0	0	0
Marshall[3]	66,726	0	0	0	0	0	0	1
Corsicana[3]	49,565	0	0	0	0	0	0	1
Totals		**4**	**4**	**7**	**2**	**3**	**20**	**55**

[1]United States Census Bureau population estimates as of July 1, 2018.

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

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

NCore - National Core Multipollutant Monitoring Stations

NO - nitrogen oxide

NO_2 - nitrogen dioxide

NO_Y - total reactive nitrogen compounds

PAMS - Photochemical Assessment Monitoring Stations

RA-40 - Regional Administrator 40

Appendix E

Sulfur Dioxide Monitor Status

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix E: Sulfur Dioxide Monitor Status

Core Based Statistical Area	County	2018 Population Estimates[1]	2018 Point Source (tpy)	2017 NEI Data (tpy)	2017 Point Source Data (tpy)	2017 NEI Non-Point Source Data with 2018 Point Source Data (tpy)	PWEI	Required SO_2 PWEI Monitors	Required SO_2 DRR Monitors	Required SO_2 NCore Monitors (high-sensitivity)	Total Required SO_2 Monitors	Existing Monitors[2]
Dallas-Fort Worth-Arlington		7,539,711				4,515	34,042	1	0	1	2	3
	Collin		21	104	6	119						
	Dallas		361	921	347	935						
	Denton		362	69	340	91						
	Ellis		1,875	1,659	1,561	1,973						
	Hunt		1	35	1	35						
	Kaufman		135	122	91	166						
	Rockwall		0	9	0	9						
	Johnson		76	105	78	103						
	Parker		92	256	234	114						
	Tarrant		26	909	23	913						
	Wise		13	24	9	28						
	Hood		22	23	18	28						
	Somervell		0	1	0	1						
Houston-The Woodlands-Sugar Land		6,997,384				49,706	347,812	2	0	1	3	5
	Austin		34	42	32	43						
	Brazoria		588	681	585	683						
	Chambers		112	203	191	125						
	Fort Bend		38,298	37,802	37,736	38,365						
	Galveston		1,363	2,382	1,819	1,925						
	Harris		7,198	8,667	7,546	8,319						
	Liberty		11	39	15	35						
	Montgomery		36	181	23	193						
	Waller		2	17	1	18						
San Antonio-New Braunfels		2,518,036				30,657	77,195	1	1	0	2	2
	Atascosa		12,132	9,316	8,779	12,669						
	Bandera		0	2	0	2						
	Bexar		16,895	13,007	12,724	17,178						
	Comal		351	428	407	372						
	Guadalupe		121	144	109	156						
	Kendall		2	7	2	8						
	Medina		0	10	0	10						
	Wilson		101	270	109	262						
Austin-Round Rock		2,168,316				2,102	4,557	0	0	0	0	1
	Bastrop		257	305	292	270						
	Caldwell		0	354	338	16						
	Hays		1,361	1,189	1,164	1,385						
	Travis		133	359	119	373						
	Williamson		5	57	5	57						
McAllen-Edinburg-Mission		865,939				128	111	0	0	0	0	0
	Hidalgo		46	125	42	128						

Appendix E: Sulfur Dioxide Monitor Status

Core Based Statistical Area	County	2018 Population Estimates[1]	2018 Point Source (tpy)	2017 NEI Data (tpy)	2017 Point Source Data (tpy)	2017 NEI Non-Point Source Data with 2018 Point Source Data (tpy)	PWEI	Required SO_2 PWEI Monitors	Required SO_2 DRR Monitors	Required SO_2 NCore Monitors (high-sensitivity)	Total Required SO_2 Monitors	Existing Monitors[2]
El Paso		845,553				373	315	0	0	1	1	1
	El Paso		255	390	282	363						
	Hudspeth		7	10	7	10						
Corpus Christi		452,950				1,003	454	0	0	0	0	3
	Aransas		0	49	0	49						
	Nueces		733	828	689	872						
	San Patricio		28	82	28	82						
Killeen-Temple		451,679				129	58	0	0	0	0	0
	Bell		64	96	43	117						
	Coryell		0	7	0	7						
	Lampasas		0	4	0	4						
Brownsville-Harlingen		423,908				83	35	0	0	0	0	0
	Cameron		1	83	1	83						
Beaumont-Port Arthur		409,526				20,520	8,403	1	2	0	3	4
	Hardin		1	12	1	12						
	Jefferson		13,951	14,002	13,849	14,105						
	Orange		6,338	6,340	6,300	6,378						
	Newton		16	22	14	25						
Lubbock		319,068				91	29	0	0	0	0	0
	Crosby		0	4	0	3						
	Lubbock		12	57	4	65						
	Lynn		0	23	0	23						
Laredo		275,910				3,994	1,102	0	0	0	0	0
	Webb		348	584	390	541						
Waco		271,942				3,453	939	0	0	0	0	1
	McLennan		3,365	3,181	3,100	3,446						
	Falls		0	7	0	7						
Amarillo		265,947				12,768	3,396	0	1	0	1	2
	Armstrong		1	1	0	2						
	Carson		0	4	0	4						
	Potter		12,437	13,106	12,937	12,606						
	Randall		119	117	93	142						
	Oldham		0	14	0	14						
College Station-Bryan		262,431				10,213	2,680	0	1	0	1	1
	Brazos		11	57	12	56						
	Burleson		0	8	0	8						
	Robertson		10,142	11,254	11,248	10,148						
Tyler		230,221				552	127	0	0	0	0	0
	Smith		506	534	488	552						

Appendix E: Sulfur Dioxide Monitor Status

Core Based Statistical Area	County	2018 Population Estimates[1]	2018 Point Source (tpy)	2017 NEI Data (tpy)	2017 Point Source Data (tpy)	2017 NEI Non-Point Source Data with 2018 Point Source Data (tpy)	PWEI	Required SO_2 PWEI Monitors	Required SO_2 DRR Monitors	Required SO_2 NCore Monitors (high-sensitivity)	Total Required SO_2 Monitors	Existing Monitors[2]
Longview		219,417				56,436	12,383	1	0	0	1	2
	Gregg		23	68	23	67						
	Rusk		56,338	36,599	36,578	56,360						
	Upshur		2	8	1	9						
Midland		178,331				1,354	242	0	0	0	0	0
	Martin		18	494	27	485						
	Midland		164	882	177	869						
Abilene		171,451				53	9	0	0	0	0	0
	Callahan		0	3	0	3						
	Jones		10	13	9	13						
	Taylor		0	37	0	37						
Odessa		162,124				1,627	264	0	0	0	0	0
	Ector		1,171	1,484	1,028	1,627						
Wichita Falls		151,306				697	105	0	0	0	0	0
	Archer		0	2	0	2						
	Clay		62	50	47	65						
	Wichita		512	606	526	592						
Texarkana		150,242				38	6	0	0	0	0	0
	Bowie		19	34	15	38						
Sherman-Denison		133,991				46	6	0	0	0	0	0
	Grayson		8	45	7	46						
San Angelo		119,711				269	32	0	0	0	0	0
	Irion		0	237	0	237						
	Sterling		1	10	1	10						
	Tom Green		2	21	2	22						
Victoria		99,619				13,607	1,356	0	0	0	0	0
	Goliad		13,354	12,365	12,202	13,517						
	Victoria		36	85	31	90						
Marshall[3]		66,726				5,359	358	NA	1	0	1	1
	Harrison		5,334	4,389	4,363	5,359						
Corsicana[3]		49,565				3,750	186	NA	1	0	1	1
	Navarro		3,730	3,812	3,792	3,750						
Big Spring[3]		37,847				6,511	246	NA	1	0	1	1
	Glasscock		79	455	254	280						
	Howard		5,742	6,835	6,346	6,231						

Appendix E: Sulfur Dioxide Monitor Status

Core Based Statistical Area	County	2018 Population Estimates[1]	2018 Point Source (tpy)	2017 NEI Data (tpy)	2017 Point Source Data (tpy)	2017 NEI Non Point Source Data with 2018 Point Source Data (tpy)	PWEI	Required SO_2 PWEI Monitors	Required SO_2 DRR Monitors	Required SO_2 NCore Monitors (high sensitivity)	Total Required SO_2 Monitors	Existing Monitors[2]
Mount Pleasant[3]		33,033				14,245	471	NA	1	0	1	1
	Titus		14,223	43,509	43,487	14,245						
Borger[3]		21,198				10,080	214	NA	1	0	1	1
	Hutchinson		10,071	11,657	11,648	10,080						
None		not available					NA	NA	NA	0	0	NA
	Freestone[4]		6,674	47,653	47,645	6,681			0	0	0	1
Total Monitors								**6**	**10**	**3**	**19**	**31**

[1]United States Census Bureau population estimates as of July 1, 2018. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

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

[3]Micropolitan statistical area

[4]Area not classified as a metropolitan or micropolitan statistical area.

DRR - Data Requirements Rule

NA - not applicable

NCore - National Core Multipollutant Monitoring Stations

NEI - National Emissions Inventory

PWEI - population weighted emission index (Core Based Statistical Area Population*[2017 NEI non-point source data and 2018 point source data]/1,000,000)

SO_2 - sulfur dioxide

tpy - tons per year

Appendix F

Sulfur Dioxide Ongoing Data Requirements Annual Report

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix F: Sulfur Dioxide Ongoing Data Requirements Annual Report

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

Out of the 245 Texas counties (or portions of counties) currently designated attainment/unclassifiable for the 2010 SO_2 NAAQS, the seven counties shown in Table 1 were designated based on modeled actual SO_2 emissions. Table 1 lists the most recent (2018) quality assured data available showing total estimated SO_2 emissions from the relevant sources in each county. The table includes emissions from the previous year (2017), the change in SO_2 emissions from 2017 to 2018, and the cause for any emissions increase.

The relevant sources in Lamb, Limestone, and Robertson counties had emissions decreases from the previous year. Since the emissions have decreased for these locations, the original designations modeling provides reasonable assurance that these areas continue to meet the 2010 one-hour SO_2 primary NAAQS.

The relevant sources in Atascosa, Fort Bend, Goliad, and Wilbarger counties had emissions increases from the previous year. Table 2 shows the average SO_2 emissions data used in the designations modeling for the four relevant sources, determined from 2013-2015 emissions data for Oklaunion Power Station in Wilbarger County and from 2012-2014 emissions data for the remaining three sources.

Table 2 also shows the average emissions data for 2016-2018, which is the data that would likely be used if additional modeling would be required to assess compliance with the SO_2 NAAQS. The comparison of these datasets shows that the original designation modeling evaluated higher average emissions for Fort Bend, Goliad, and Wilbarger counties, providing reasonable assurance that these three areas continue to meet the 2010 one-hour SO_2 primary NAAQS. For Atascosa County, although the comparison shows that the 2016-2018 average emissions data exceeds the average of the 2012-2014 emissions data used for designation modeling by 151 tons per year, this small increase of approximately 1.7 percent of SO_2 emissions would not be expected to change the attainment/unclassifiable designation determined from the original modeling.

The TCEQ recommends that no additional SO_2 air quality modeling is needed to determine compliance with the 2010 SO_2 NAAQS for any of the seven Texas counties listed in Table 1.

Table 1: 2017 to 2018 Emissions Comparisons

County	Relevant Source	2017 SO_2 (tpy)	2018 SO_2 (tpy)	Difference 2017 to 2018	Cause for Emission Increase
Atascosa	San Miguel Electric Plant	8,584	11,880	3,296	Increased operation
Fort Bend	W.A. Parish Electric Generating Station	37,651	38,165	514	Increased operation from some units

Appendix F: Sulfur Dioxide Ongoing Data Requirements Annual Report

County	Relevant Source	2017 SO_2 (tpy)	2018 SO_2 (tpy)	Difference 2017 to 2018	Cause for Emission Increase
Goliad	Coleto Creek Power Station	12,202	13,213	1,011	Increased operation
Lamb	Tolk Station Power Plant	13,625	9,958	-3,667	NA
Limestone	Limestone Electric Generating Station	10,240	8,320	-1,920	NA
Robertson	Twin Oaks Power Station	2,472	2,523	-3,328	NA
Wilbarger	Oklaunion Power Station	988	2,191	1,204	Increased operation

NA – not applicable
SO_2 – sulfur dioxide
tpy – tons per year

Table 2: Average Emissions Comparison

County	Relevant Source	2012-2014 SO_2 Average (tpy)	2016-2018 SO_2 Average (tpy)	Three Year Average SO_2 Comparison Change
Atascosa	San Miguel Electric Plant	8,942	9,093	151
Fort Bend	W.A. Parish Electric Generating Station	41,520	36,651	-4,869
Goliad	Coleto Creek Power Station	15,832	11,215	-4,617
Wilbarger	Oklaunion Power Station	2,932*	1,570	-1,362

*2013-2015 SO_2 emissions inventory average utilized in designations modeling
SO_2 – sulfur dioxide
tpy – tons per year

Appendix G

Total Suspended Particulate Lead Monitor Status

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix G: Total Suspended Particulate Lead Monitor Status

Metropolitan Statistical Area	County	Pb Source (Facility Name)	2018 Pb Source Emissions (tpy)	2017 Pb Source Emissions (tpy)	2016 Pb Source Emissions (tpy)	Site Name	Required Monitors[1]	Existing Monitors[1]
Dallas-Fort Worth- Arlington							3	3
	Collin	Maintenance Area	NA	NA	NA	Frisco Eubanks[1,2]	1	1
	Collin	Maintenance Area	NA	NA	NA	Frisco Stonebrook[2]	1	1
	Kaufman	Conecsus, LLC	0.2812	0.2617	0.3401	Terrell Temtex[1]	1	1
El Paso							0	2
	El Paso	None	NA	NA	NA	El Paso UTEP	0	1
	El Paso	None	NA	NA	NA	Ojo De Agua	0	1
Totals							**3**	**5**

[1]Collocated quality control monitors are not included in totals.
[2]Monitor required to fulfill State Implementation Plan commitments.
LCC - Limited Liability Company
NA - not applicable
Pb - lead
tpy - tons per year
UTEP - University of Texas at El Paso

Appendix H

Ozone Monitor Status

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix H: Ozone Monitor Status

Metropolitan Statistical Area	2018 Population Estimates[1]	2016 2018 8 Hour Design Value (ppm)	Design Value as Percent of NAAQS[2]	Total Required SLAMS Monitors	Total Required NCore/PAMS Monitors	Total Required Monitors[3]	Total Existing Monitors[4]
Dallas-Fort Worth-Arlington	7,539,711	0.076	109%	3	1	4	19
Houston-The Woodlands-Sugar Land	6,997,384	0.078	111%	3	1	4	20
San Antonio-New Braunfels	2,518,036	0.072	103%	2	0	2	3
Austin-Round Rock	2,168,316	0.068	97%	2	0	2	2
McAllen-Edinburg-Mission	865,939	0.055	79%	1	0	1	1
El Paso	845,553	0.073	104%	2	1	3	6
Corpus Christi	452,950	0.061	87%	2	0	2	2
Killeen-Temple	451,679	0.068	97%	2	0	2	2
Brownsville-Harlingen	423,908	0.057	81%	1	0	1	1
Beaumont-Port Arthur	409,526	0.067	96%	2	0	2	7
Lubbock	319,068	NA	NA	0	0	0	0
Laredo	275,910	0.053	76%	0	0	0	1
Waco	271,942	0.064	91%	1	0	1	1
Amarillo	265,947	NA	NA	0	0	0	0
College Station-Bryan	262,431	NA	NA	0	0	0	0
Tyler	230,221	0.065	93%	1	0	1	1
Longview	219,417	0.065	93%	1	0	1	1
Midland	178,331	NA	NA	0	0	0	0
Abilene	171,451	NA	NA	0	0	0	0
Odessa	162,124	NA	NA	0	0	0	0
Wichita Falls	151,306	NA	NA	0	0	0	0
Texarkana	150,242	NA	NA	0	0	0	0
Sherman-Denison	133,991	NA	NA	0	0	0	0
San Angelo	119,711	NA	NA	0	0	0	0
Victoria	99,619	0.064	91%	1	0	1	1
Marshall[5]	66,726	0.061	87%	0	0	0	1
Corsicana[5]	49,565	0.064	91%	0	0	0	1
Totals				**24**	**3**	**27**	**70**

[1]United States Census Bureau population estimates as of July 1, 2018.
[2]2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS) is 0.070 parts per million (ppm).
[3]Total Required Monitors is a sum of requirements for SLAMS, PAMS, and NCore.
[4]Monitors may fulfill multiple monitoring requirements and are only counted once.
[5]Area is classified as a micropolitan statistical area and is not subject to SLAMS requirements.
NA - not applicable
NCore - National Core Multipollutant Monitoring Stations
PAMS - Photochemical Assessment Monitoring Stations
SLAMS - State or Local Air Monitoring Stations

Appendix I

Carbon Monoxide Monitor Status

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix I: Carbon Monoxide Monitor Status

Core Based Statistical Area[5]	2018 Population Estimates[1]	Site Name	Required CO NCore Monitors	Required CO Near-Road Monitors	Total Required Monitors[4]	Total Existing Monitors[2]
Dallas-Fort Worth-Arlington	7,539,711				2	2
		Dallas Hinton[3]	1	0	1	1
		Fort Worth California Parkway	0	1	1	1
Houston-The Woodlands-Sugar Land	6,997,384				2	3
		Clinton[3]	0	0	0	1
		Houston Deer Park #2[3]	1	0	1	1
		Houston North Loop	0	1	1	1
San Antonio-New Braunfels	2,518,036				1	1
		San Antonio Interstate 35	0	1	1	1
Austin-Round Rock	2,168,316				1	1
		Austin North Interstate 35	0	1	1	1
El Paso	845,553				1	3
		El Paso Chamizal[3]	1	0	1	1
		El Paso UTEP	0	0	0	1
		Ojo De Agua	0	0	0	1
Laredo	275,910				0	1
		Laredo Vidaurri	0	0	0	1
Waco	271,942				0	1
		Waco Mazanec	0	0	0	1
Totals			**3**	**4**	**7**	**12**

[1]United States Census Bureau population estimates as of July 1, 2018.
[2]Monitors may fulfill multiple monitoring requirements and are only counted once.
[3]High-Sensitivity CO monitor (high-sensitivity CO monitors are recommended at NCore sites) [4]Total Required Monitors is a sum of requirements for NCore and Near-Road.
[5]This list does not include metropolitan statistical areas with zero requirements and zero monitors.
- number
CO - carbon monoxide
NCore - National Core Multipollutant Monitoring Stations
UTEP – University of Texas at El Paso

Appendix J

Particulate Matter of 10 Micrometers or Less Monitor Status

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix J: Particulate Matter of 10 Micrometers or Less Monitor Status

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

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	2016 2018 Maximum Concentration (µg/m^3)	Percent of NAAQS[2] (%)	Required Monitors[3]	Existing Monitors[3]
Dallas-Fort Worth-Arlington	7,539,711				2-4	2
		Earhart	83	55		
		Convention Center (collocated pair)	102	68		
Houston-The Woodlands-Sugar Land	6,997,384				2-4	5
		Clinton (collocated pair)	111	74		
		Houston Monroe	97	65		
		Houston Westhollow	95	63		
		Lang	101	67		
		Texas City Fire Station	105	70		
San Antonio-New Braunfels	2,518,036				2-4	2
		San Antonio Bulverde Parkway[4] (previously Selma)	NA	NA		
		Frank Wing Municipal Court	117	78		
Austin-Round Rock	2,168,316				2-4	2
		Austin Webberville Road	97	65		
		Austin Audubon Society	90	60		
McAllen-Edinburg-Mission	865,939				1-2	2
		Mission	93	62		
		Edinburg East Freddy Gonzalez Drive	90	60		
El Paso	845,553				2-4	5
		El Paso Mimosa (previously Riverside)	126	84		
		Ivanhoe	85	57		
		Ojo De Agua (collocated pair)	137	91		
		Socorro Hueco (collocated pair)	114	76		
		Van Buren	134	89		
Corpus Christi	452,950				0-1	1
		Dona Park	84	56		
Laredo	275,910				0-1	2

Appendix J: Particulate Matter of 10 Micrometers or Less Monitor Status

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

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	2016 2018 Maximum Concentration (µg/m^3)	Percent of NAAQS[2] (%)	Required Monitors[3]	Existing Monitors[3]
		Laredo Vidaurri	81	54		
		Laredo Bridge	75	50		
Killeen-Temple	451,679		NA	0	0-1	0
Brownsville-Harlingen	423,908		NA	0	0-1	0
Beaumont-Port Arthur	409,526		NA	0	0-1	0
Lubbock	319,068		NA	0	0-1	0
Waco	271,942		NA	0	0-1	0
Amarillo	265,947		NA	0	0-1	0
College Station-Bryan	262,431		NA	0	0-1	0
Totals					**11-31**	**21**

[1]United States Census Bureau population estimates as of July 1, 2018.
[2]Current PM_{10} NAAQS is 150 micrograms per cubic meter (µg/m^3).
[3]Collocated quality control monitors are not counted.
[4]Monitor deployed at site with new identification numbers, incomplete design values are not used for regulatory compliance.
This list doesn't include metropolitan statistical areas with zero requirements and zero monitors.
% - percent
NAAQS - National Ambient Air Quality Standards
PM_{10} - particulate matter of 10 micrometers or less

Appendix J: Particulate Matter of 10 Micrometers or Less Monitor Status

Table 2: Particulate Matter of 10 Micrometers or Less Monitor Concentrations

Site Name	2016-2018 Maximum Concentration (µg/m³)	2018 Annual Mean Concentration (µg/m³)	2017 Annual Mean Concentration (µg/m³)	2016 Annual Mean Concentration (µg/m³)
Socorro Hueco (collocated pair)	114	34.4*	32.1*	24.5*
Van Buren	134	30.6*	20.4	14.0
El Paso Mimosa (previously Riverside)	126	29.3*	27.8*	22.8
Clinton (collocated pair)	111	29.2*	27.4*	44.4*
Laredo Vidaurri	81	25.1*	22.0*	19.6
Edinburg East Freddy Gonzalez Drive	90	24.9*	22.9*	22.2
Ojo De Agua (collocated pair)	137	24.8*	21.3	23.6
Mission	93	24.8*	24.8*	26.3*
Convention Center (collocated pair)	102	24.6	20.9	24.0*
Earhart	83	23.8	23.6*	24.1*
Houston Monroe	97	22.9	21.4	25.2*
Austin Webberville Road	97	22.6	22.0*	23.6
Lang	101	22.2	21.2	25.1*
Laredo Bridge	75	21.9	18.7	19.5
Frank Wing Municipal Court	117	20.8	21.7	21.9
Ivanhoe	85	20.7	19.4	18.6
Texas City Fire Station	105	20.6	13.6	18.5
Dona Park	84	20.3	19.9	23.3
Austin Audubon Society	90	17.5	14.8	16.8
Houston Westhollow	95	16.5	16.2	20.6
San Antonio Bulverde Parkway** (previously Selma)	NA	NA	NA	NA

*Highest concentrations ranked for 33% of sites, ensuring at least half of collocation monitoring at network sites among the highest.

**Monitor with new identification numbers deployed at site. As a result, there is not enough data to calculate design values. Incomplete design values are not used for regulatory compliance.

Appendix K: Particulate Matter of 2.5 Micrometers or Less Monitor Status

Table 1: Particulate Matter of 2.5 Micrometers or Less Monitor Status

Metropolitan Statistical Area	2018 Population Estimates[1]	2016-2018 DV (µg/m^3) Annual (for Area)	2016-2018 DV (µg/m^3) 24-Hour (for Area)	Percent of NAAQS Annual[2] (for Area)	Percent of NAAQS 24-Hour[3] (for Area)	Required FRM/FEM Monitors	Required NCore Monitors	Required Near-Road Monitors[2]	Total Required Monitors[4]	Total Existing Monitors[4]
Dallas-Fort Worth-Arlington	7,539,711	8.9	20	74	57	2	4	1	7	13
Houston-The Woodlands-Sugar Land	6,997,384	10.2	25	85	71	3	4	1	8	13
San Antonio-New Braunfels	2,518,036	8.1	24	68	69	2	0	1	3	5
Austin-Round Rock	2,168,316	9.8	22	82	63	2	0	1	2	3
McAllen-Edinburg-Mission	865,939	10.7	28	89	80	2	0	0	2	2
El Paso	845,553	9.1	24	76	69	1	4	0	5	8
Corpus Christi	452,950	9.1	25	76	71	0	0	0	0	4
Killeen-Temple[5]	451,679	NA	NA	NA	NA	0	0	0	0	1
Brownsville-Harlingen	423,908	9.9	25	83	71	0	0	0	0	2
Beaumont-Port Arthur[5]	409,526	NA	NA	NA	NA	0	0	0	0	3
Lubbock[5]	319,068	NA	NA	NA	NA	0	0	0	0	1
Laredo[5]	275,910	NA	NA	NA	NA	0	0	0	0	1
Waco	271,942	NA	NA	NA	NA	0	0	0	0	1
Amarillo[5]	265,947	NA	NA	NA	NA	0	0	0	0	1
College Station-Bryan	262,431	NA	NA	NA	NA	0	0	0	0	1
Odessa[5]	162,124	NA	NA	NA	NA	0	0	0	0	1
Texarkana	150,242	8.9	19	74	54	0	0	0	0	1
Marshall[6]	66,726	8.5	18	71	51	0	0	0	0	3
Eagle Pass[5,6]	58,485	NA	NA	NA	NA	0	0	0	0	1
Corsicana[6]	49,565	NA	NA	NA	NA	0	0	0	0	1
Kingsville[6]	31,571	NA	NA	NA	NA	0	0	0	0	1
Big Bend National Park[5,7]	not available	NA	NA	NA	NA	0	0	0	0	1
Totals*						**12**	**12**	**4**	**27**	**68**

[1]United States Census Bureau population estimates as of July 1, 2018. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

[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]Individual monitors may fulfill multiple requirements and are only counted once. Collocated quality control monitors are not included in totals.

[5]Annual values do not meet completeness criteria; monitors deployed in 2017, 2018, or 2019. Incomplete design value information is not used for the purposes of regulatory compliance.

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

[7]Area not classified as a metropolitan or micropolitan statistical area.

This list does not include metropolitan statistical areas with no requirement and no monitors.

DV - design value

FEM - federal equivalent method

FRM - federal reference method

NA - not applicable

NAAQS - National Ambient Air Quality Standards

Appendix K: Particulate Matter of 2.5 Micrometers or Less Monitor Status

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]
Dallas-Fort Worth-Arlington	7,539,711			8.9	20	74	57	2	7	Y	4	1	7	13
		Convention Center	145	8.9	19	74	54	1	0		0	0	1	1
		Dallas Hinton (collocated pair)	145, (145), 170, 185, [810, 811, 812, 838][5]	8.9	20	74	57	0	1		4	0	4	4
		Denton Airport South	209	NA	NA	NA	NA	0	1		0	0	0	1
		Fort Worth California Parkway North	209, (209)	8.6	18	72	51	0	1		0	1	1	1
		Fort Worth Northwest	209	8.2	18	68	51	1	1		0	0	1	1
		Haws Athletic Center	209	8.4	18	70	51	0	1		0	0	0	1
		Kaufman	702[6]	NA	NA	NA	NA	0	1		0	0	0	1
		Midlothian OFW	145, 702[6], [826, 831, 838, 839, 840, 841, 842, 846, 849][5]	8.4	20	70	57	0	1		0	0	0	3

Appendix K: Particulate Matter of 2.5 Micrometers or Less Monitor Status

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]
Houston-The Woodlands-Sugar Land	6,997,384			10.2	25	85	71	3	8	Y	4	1	8	13
		Baytown	209	9.3	24	78	69	1	1		0	0	1	1
		Clinton (collocated pair)	145, (145), 702[6]	10.2	22	85	63	1	1		0	0	1	2
		Conroe Relocated	702[6]	NA	NA	NA	NA	0	1		0	0	0	1
		Galveston 99th Street	209	6.6	22	55	63	0	1		0	0	0	1
		Houston Aldine (collocated pair)	209, (145)	9.4	25	78	71	1	1		0	0	1	1
		Houston Deer Park #2	145, 170, 185, [810, 811, 812, 838][5]	8.2	20	68	57	0	1		4	0	4	4
		Houston East	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
		Houston North Loop	145	9.9	23	83	66	0	0		0	1	1	1
		Seabrook Friendship Park	702[6]	NA	NA	NA	NA	0	1		0	0	0	1

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]
San Antonio-New Braunfels	2,518,036			8.1	24	68	69	2	5	Y	0	1	3	5
		Calaveras Lake	209	7.7	24	64	69	1	1		0	0	1	1
		Old Hwy 90	178[6]	NA	NA	NA	NA	0	1		0	0	0	1
		Von Ormy (replaced Palo Alto)	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
		San Antonio Interstate 35	209[7]	NA	NA	NA	NA	0	1		0	1	1	1
		San Antonio Northwest (collocated pair)	209, (145)	8.1	19	68	54	1	1		0	0	1	1
Austin-Round Rock-Georgetown	2,168,316			9.8	22	82	63	2	3	Y	0	1	2	3
		Austin North Interstate 35[7]	209	NA	NA	NA	NA	1	1		0	1	1	1
		Austin Northwest	702[6]	NA	NA	NA	NA	0	1		0	0	0	1
		Austin Webberville Road (collocated pair)	209, (145)	9.8	22	82	63	1	1		0	0	1	1
McAllen-Edinburg-Mission	865,939			10.7	28	89	80	2	1	Y	0	0	2	2
		Edinburg East Freddy Gonzalez Drive	145	9.3	25	78	71	1	0		0	0	1	1
		Mission	209	10.7	28	89	80	1	1		0	0	1	1

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]
El Paso	845,553			9.1	24	76	69	1	4	Y	4	0	5	8
		Ascarate Park SE	702[6]	NA	NA	NA	NA	0	1		0	0	0	1
		El Paso Chamizal (collocated pair)	145, 170, 185, [810, 811, 812, 838][5]	9.1	24	76	69	0	1		4	0	4	4
		El Paso UTEP	145, 702[6]	7.7	17	64	49	1	1		0	0	1	2
		Socorro Hueco	702[6]	NA	NA	NA	NA	0	1		0	0	0	1
Corpus Christi	452,950			9.1	25	76	71	0	2	NA	0	0	0	4
		Corpus Christi Huisache (collocated pair)	209, (209)	9.1	25	76	71	0	1		0	0	0	1
		Dona Park	145, 702[6], [826, 831, 838, 839, 840, 841, 842, 846, 849][5]	8.0	24	67	69	0	1		0	0	0	3
Killeen-Temple	451,679			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Temple Georgia	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
Brownsville-Harlingen	423,908			9.9	25	83	71	0	2	NA	0	0	0	2
		Brownsville	209	9.9	25	83	71	0	1		0	0	0	1
		Isla Blanca Park	209[7]	NA	NA	NA	NA	0	1		0	0	0	1

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]
Beaumont-Port Arthur	409,526			NA	NA	NA	NA	0	3	NA	0	0	0	3
		Hamshire	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
		Port Arthur Memorial School	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
		SETRPC 42 Mauriceville	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
Lubbock	319,068			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Lubbock 12th Street	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
Laredo	275,910			NA	NA	NA	NA	0	1	NA	0	0	0	1
		World Trade Bridge	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
Waco	271,942			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Waco Mazanec	178[6]	NA	NA	NA	NA	0	1		0	0	0	1
Amarillo	265,947			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Amarillo A&M	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
College Station-Bryan	262,431			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Bryan Finfeather Road	209[7]	NA	NA	NA	NA	0	1		0	0	0	1

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]
Odessa	162,124			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Odessa Gonzales	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
Texarkana	150,242			8.9	19.0	74	54	0	1	NA	0	0	0	1
		Texarkana New Boston	209	8.9	19	74	54	0	1		0	0	0	1
Marshall[8]	66,726			8.5	18	71	51	0	1	NA	0	0	0	3
		Karnack	145, 702[6], [810, 811, 812, 838][5]	8.5	18	71	51	0	1		0	0	0	3
Eagle Pass[8]	58,485			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Eagle Pass	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
Corsicana[8]	49,565			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Corsicana Airport	702[6]	NA	NA	NA	NA	0	1		0	0	0	1
Kingsville[8]	31,571			NA	NA	NA	NA	0	1	NA	0	0	0	1
		National Seashore	209[7]	NA	NA	NA	NA	0	1		0	0	0	1

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]
Big Bend National Park[9]	NA			NA	NA	NA	NA	0	1	NA	0	0	0	1
		Bravo Big Bend	209[7]	NA	NA	NA	NA	0	1		0	0	0	1
Totals								**12**	**48**	**Y**	**12**	**4**	**27**	**68**

[1]United States Census Bureau population estimates as of July 1, 2018. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk
[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]Individual monitors may fulfill multiple requirements and are only counted once. Collocated quality control monitors are not included in totals.
[5]Speciation monitor for NCore, Chemical Speciation Network (CSN), or special purpose requirements.
[6]Method code identifies a $PM_{2.5}$ TEOM which is non-FEM/FRM (non-NAAQS comparable)
[7]Annual values do not meet completeness criteria; monitors deployed in 2017, 2018, 2019, or 2020. Incomplete design value information is not used for regulatory compliance.
[8]Area is classified as a micropolitan area and is not subject to SLAMS requirements.
[9]Area not classified as a metropolitan or micropolitan statistical area.
[10]Continuous $PM_{2.5}$ monitor network total must equal at least one-half the required number of SLAMS-required sites and each MSA with SLAMS-required sites must have a minimum of
[11]This list does not include metropolitan statistical areas with no requirement and no monitors.
- number
[ ] - include $PM_{2.5}$ speciation method codes
DV - design value
FEM - federal equivalent method
FRM - federal reference method
Hwy - highway
NA - not applicable
NAAQS - National Ambient Air Quality Standards
NCore - National Core Multipollutant Monitoring Stations require $PM_{2.5}$ FRM mass, $PM_{2.5}$ FEM continuous mass, $PM_{10-2.5}$ and $PM_{2.5}$ CSN speciation
N - no
OFW - Old Fort Worth
$PM_{2.5}$ FRM mass method code 145
$PM_{2.5}$ FEM mass method codes 170 and 209
$PM_{2.5}$ non-regulatory mass method code 702
$PM_{2.5}$ speciation method codes 810, 811, 812, 826, 831, 838, 839, 840, 841, 842, 846, and 849
$PM_{10-2.5}$ coarse method code 185

Table 2: Particulate Matter of 2.5 Micrometers or Less Monitor Locations and Method Codes[11]

Metropolitan Statistical Area	2018 Population Estimates[1]	Site Name	Method Code(s)	2016-2018 Annual DV (µg/m^3)	2016-2018 24-Hour DV (µg/m^3)	Percent of NAAQS (Annual[2])	Percent of NAAQS (24-Hour[3])	Required SLAMS FRM/FEM Monitor[4]	Continuous Monitor[10]	Continuous Requirement Met[10]	Required NCore Monitor	Required Near-Road Monitor	Total Required Monitors[4]	Total Existing Monitors[4]

SETRPC - Southeast Texas Regional Planning Commission
SE - southeast
SLAMS - State or Local Air Monitoring Stations
UTEP - University of Texas at El Paso
Y - yes

Appendix L

Volatile Organic Compound and Carbonyl Monitor Status

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix L: Volatile Organic Compound and Carbonyl Monitor Status

Table 1: Volatile Organic Compound Monitor Status

Core Based Statistical Area[1]	Required PAMS VOC AutoGC Monitors	Existing VOC Canister Monitors	Existing VOC AutoGC Monitors	Total Existing VOC Monitors
Dallas-Fort Worth-Arlington	1	3	2	5
Houston-The Woodlands-Sugar Land	1	0	3	3
El Paso	0	0	1	1
Beaumont-Port Arthur	0	0	2	2
Laredo	0	1	0	1
Totals	**2**	**4**	**8**	**12**

[1]This list does include metropolitan statistical areas with zero requirements and zero monitors.
AutoGC – automated gas chromatograph
PAMS – Photochemical Assessment Monitoring Stations
VOC – volatile organic compound

Table 2: Carbonyl Monitor Status

Core Based Statistical Area[1]	Required PAMS Carbonyl Samplers	Total Existing Carbonyl Samplers
Dallas-Fort Worth-Arlington	1	2
Houston-The Woodlands-Sugar Land	1	2
Totals	**2**	**4**

[1]This list does not include metropolitan statistical areas with zero requirements and zero monitors.
PAMS – Photochemical Assessment Monitoring Stations

Appendix M

TCEQ Response to Comments Received on the 2020 Annual Monitoring Network Plan

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan

Appendix M: TCEQ Response to Comments Received on the 2020 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 *2020 Annual Monitoring Network Plan* (AMNP) for public inspection for 30 days prior to submittal to the United States (U.S.) Environmental Protection Agency (EPA). In fulfillment of 40 CFR Part 58.10, the TCEQ provided a detailed analysis of Appendix D network design requirements and how the network meets these requirements. The 2020 AMNP presented the current Texas federal network with completed or proposed network changes from July 1, 2018, through December 31, 2020.

As outlined under 40 CFR Part 58.10, submittal of the AMNP is required to demonstrate the TCEQ's compliance with federal air monitoring requirements under 40 CFR Part 58 and is limited to federally funded monitors. The TCEQ also operates state-funded monitors and often locates these monitors to evaluate local air quality concerns; however, these monitors are outside the scope of the AMNP. Information and data from both federal and state-funded monitors are available to the public from the TCEQ Texas Air Monitoring Information System (TAMIS) database.

During the public comment period from April 15, 2020, to May 14, 2020, the TCEQ received 163 individual comments on the posted document. Comments received by the TCEQ relating to the TCEQ federal ambient air quality network, as described in the plan, are addressed in this appendix. No changes to the 2020 AMNP were made in response to the comments.

Comment Summaries and TCEQ Responses

Comment 1: Sierra Club, Environmental Defense Fund, Environmental Integrity Project, Public Citizen, Environment Texas, and the Texas Environmental Justice Advocacy Services (Sierra Club et al.) asserted that the TCEQ's proposed 2020 AMNP is a State Implementation Plan (SIP) revision that should be subject to notice and comment rulemaking. The comment states that the Federal Clean Air Act and its implementing regulation make it clear that a State's monitoring plan is part of its SIP, 42 United States Code (USC) Part 7410(1). Sierra Club et al. requested that TCEQ remand this Plan and revise it through notice and comment rulemaking. Further, the commenter requested that the TCEQ hold a public hearing, with Spanish interpretation services available, in Houston or El Paso to afford the public an opportunity to ask questions about the AMNP to the TCEQ staff responsible for its creation and implementation. Sierra Club et al. also commented that the TCEQ webpage notice for comment does not explain whether the TCEQ will respond to comments or make AMNP changes in response to any comments.

Response 1: The 2020 AMNP is not a revision to the SIP subject to notice and comment rulemaking procedures. This was affirmed by the Court of Appeals for the District of Columbia Circuit in a decision issued on May 31, 2019, in the case *Sierra Club v. Environmental Protection Agency*, 925 F.3d 490 (D.C. Cir. 2019). Sierra Club

petitioned for review of EPA's Revision to Ambient Monitoring Quality Assurance and Other Requirements, 81 *Federal Register* 17,248 (March 28, 2016), which modified 40 CFR Part 58.

One of the Sierra Club's issues in this case concerned whether AMNPs should be subject to notice and comment rulemaking. The Court stated that the EPA adopted regulations in 2006 that specifically place these plans outside the SIP-review process [see Revisions to Ambient Air Monitoring Regulations, 71 *Federal Register* 61,236 (October 17, 2006)]. Because the Clean Air Act requires that petitions for review of agency regulations be filed within sixty days of a challenged action appearing in the Federal Register, the Sierra Club could not re-open the issue more than ten years later. The court found that the EPA's 2006 rulemaking makes clear that the annual monitoring network plans are not components of a SIP that require notice and comment. Instead a state must make the plan "available for public inspection," without requiring the formal notice and comment procedures that are necessary for SIP revisions. The court also found that the EPA's rulemaking that was under review in this case did not change these requirements and that there was no indication EPA intended to address or change the non-SIP approach for annual monitoring network plans.

Therefore, because SIP notice and comment procedures are not required under federal rule and the TCEQ's current public comment process for the AMNP complies with 40 CFR §58.10(a)(1), the TCEQ is not compelled to hold public hearings on the AMNP. The TCEQ is responding to the comments that were received during the provided notice period for the plan and is submitting all comments and responses to the EPA.

TCEQ appreciates the comments regarding the need for greater outreach, especially the provision of information in Spanish. One way the TCEQ does this is by providing a link to Spanish-language information on TCEQ's main website, which includes a link to EPA's Spanish-language page. Individuals needing basic information of EPA's requirements can search EPA's website for information concerning environmental topics or can request such information from the TCEQ. The TCEQ will work to add specific information regarding air monitoring to our Spanish language webpage.

The TCEQ acknowledges that the AMNP webpage notice did not indicate that the TCEQ would make changes to the plan based on comments, if deemed appropriate. However, the webpage notice did indicate that TCEQ would respond to comments and provide the responses to EPA, as required under 40 CFR §58.10(a)(1). The webpage language for future plans will clarify that TCEQ may make changes to the plan based on comments, if deemed appropriate.

Comment 2: The Sierra Club et al. strongly supported TCEQ's placement of a new particulate matter of 2.5 micrometers or less in diameter ($PM_{2.5}$) federal reference monitor (FRM) in west Houston, suggested a $PM_{2.5}$ monitor should also be placed at the TCEQ Bayland Park monitoring station, existing $PM_{2.5}$ monitors should be maintained at their current locations, and that the TCEQ should work with the City of Houston, Harris County, and the EPA to support the installation of lower cost community monitors throughout Houston to provide communities early warning and aid regulators to take action against polluters. The Sierra Club et al. suggested the

TCEQ should initiate a $PM_{2.5}$ speciation source apportionment study to determine the sources of $PM_{2.5}$ in west Houston and develop a plan to reduce $PM_{2.5}$ emissions in that area. Sierra Club et al. noted that recent peer-reviewed, published research and an ensemble model of satellite and 2000 to 2015 data identified a high concentration of $PM_{2.5}$ in areas of Houston not previously identified due to a lack of monitors and that existing Houston network does not meet EPA regulatory requirements to place monitors in an area of expected maximum concentration and to represent area-wide air quality.

Response 2: The TCEQ appreciates the support from the Sierra Club et al. to add a $PM_{2.5}$ monitor in west Houston, and points out that the 2020 AMNP monitor proposed for Houston Westhollow is a continuous federal equivalent monitor (FEM) and not an FRM non-continuous monitor. $PM_{2.5}$ continuous FEM monitors provide near real-time data, while non-continuous FRM monitor data must be analyzed by a laboratory and data are not available to the public for a period of time.

The TCEQ Houston area $PM_{2.5}$ federal monitoring network includes 13 area $PM_{2.5}$ monitors to measure ambient $PM_{2.5}$ concentration data through gravimetric, speciation, and continuous measurements to determine maximum concentrations, concentrations in areas of high population density, and background and transport concentrations. The TCEQ exceeds the Houston area federal requirement for eight monitors, see Figure 2 (below on page M-16) and Appendix B of the 2020 AMNP. As noted in the 2020 AMNP, a $PM_{2.5}$ continuous monitor will be added to the Houston North Wayside air monitoring site, to improve population exposure coverage just northeast of Interstate Loop 610 and is expected to be operational soon. Additional Houston area network upgrades noted in the 2020 AMNP include replacing non-National Ambient Air Quality Standards (NAAQS) comparable continuous $PM_{2.5}$ monitors with $PM_{2.5}$ FEM monitors at Clinton, Conroe Relocated, and Seabrook Friendship Park. The plan also includes replacing the $PM_{2.5}$ FRM (sampling every third day) with a continuous $PM_{2.5}$ FEM and additional $PM_{2.5}$ speciation at the Clinton site in 2021. The TCEQ notes that the 2020 AMNP does not recommend any $PM_{2.5}$ FEM monitor location changes or decommissions, only additions.

The TCEQ operates Houston area $PM_{2.5}$ monitors in areas with expected maximum concentrations fulfilling requirements listed in 40 CFR Part 58, Appendix D, Section 4.7. Specifically, 40 CFR Part 58, Appendix D, Section 4.7.1(b)(1), requires at least one monitoring station sited in an area of expected maximum concentration. Houston area $PM_{2.5}$ monitor data shows that the Clinton site has historically fulfilled this requirement, see Figure 3. The current proposed $PM_{2.5}$ FEM monitor placement in west Houston will provide data for the west Houston area, indicated in recent peer-reviewed reports and modeling as possibly containing maximum concentrations higher than areas currently monitored. Data from this monitor will be useful to determine if additional west Houston area $PM_{2.5}$ monitoring is needed to characterize the area. TCEQ will further assess west Houston, including monitoring needs at the TCEQ Houston Bayland Park site, or other Houston area $PM_{2.5}$ monitoring needs again in 2021.

As stated in the introduction, the 2020 AMNP is intended to demonstrate the TCEQ's compliance with federal air monitoring requirements under 40 CFR Part 58. With the

addition of the new west Houston $PM_{2.5}$ FEM monitor, the $PM_{2.5}$ Houston network, as proposed, exceeds all federal requirements. Community-placed monitors, which are not required and may not be NAAQS comparable, $PM_{2.5}$ speciation source apportionment studies to determine the sources of $PM_{2.5}$ in west Houston, and emissions reduction plans are beyond the scope of the AMNP, which is to document a monitor network that meets federal monitoring requirements.

Comment 3: Sierra Club et al. requested that the TCEQ place lead (Pb) and volatile organic compound (VOC) monitors in the Fifth Ward, a community in east Houston near a Superfund site. The commenters also asserted that the residents needed air quality data so they can take action to protect their health from elevated levels of lead and VOCs and to alert regulatory officials when they need to take specific action against potential emitters. Commenters noted that Fifth Ward monitoring beyond the minimum requirements would provide data for policy decisions, as required by 40 CFR Part 58.2(a)(5), would allow residents to access air pollution data in a timely manner, as required by 40 CFR Part 58, Appendix D, Section 1.1(a), and will provide data to inform public health policy decisions. Sierra Club et al. commented that metal recycling was a Fifth Ward public health concern and that an Environmental Defense Fund (EDF) analysis found that roads adjacent to these facilities had elevated air pollution and that there was a clear need for PM monitoring in this part of Houston.

Response 3: As previously stated, this plan addresses federally required monitoring and demonstrates the TCEQ's compliance with requirements under 40 CFR Part 58. Federal Pb monitoring regulations require monitoring near Pb sources with emissions greater than 0.50 tons per year (tpy) or near sources expected to exceed the Pb NAAQS. No sources meeting these criteria are in the Fifth Ward. The Pb regulations in 40 CFR Part 58 do not include requirements related to Superfund sites. The TCEQ is meeting federal requirements for Pb monitoring. Photochemical Assessment Monitoring Stations (PAMS) air monitoring objectives include collecting data to evaluate and support development of air quality models and to track ozone (O_3) precursor concentration trends. The TCEQ is required to have one Houston Metro area PAMS automated gas chromatograph (autoGC) for speciated VOCs and operates three such monitors, exceeding federal PAMS VOC monitoring requirements. The detailed TCEQ enhanced O_3 and O_3 precursor monitoring activities are included in the 2019 AMNP Appendix M.

The TCEQ meets and exceeds the requirements of 40 CFR Part 58, Appendix D, Section 1.1(a) by providing air pollution data to the general public in a timely manner with data presented in the interactive monitoring map (GeoTAM) (https://tceq.maps.arcgis.com/apps/webappviewer/index.html?id=ab6f85198bda483a997a6956a8486539), TAMIS (https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome), and on the TCEQ Today's Texas Air Quality Forecast (https://www.tceq.texas.gov/airquality/monops/forecast_today.html).

The TCEQ operates a robust Houston federal air monitoring network with four air monitoring sites within four to six miles of the Houston Fifth Ward. Timely data from these monitors are provided to the public as discussed above for continuously monitored VOCs, carbon monoxide (CO), oxides of nitrogen (NO_x), O_3, and sulfur

dioxide (SO_2). As described in the 2020 AMNP, monitoring for particulate matter of 10 micrometers or less (PM_{10}) and $PM_{2.5}$ are either occurring or are planned at these four air monitoring sites within four to six miles of the Houston Fifth Ward.

Comment 4: Sierra Club et al. appreciated the enhanced PM_{10} monitoring proposed in the Portland-Gregory area but commented that recent permitting actions with staggering permitted emission limits urgently warranted enhanced VOC monitoring, as emissions of VOCs will far exceed new emissions of PM_{10} by a factor greater than five, and potentially $PM_{2.5}$ monitoring since one purpose of the air monitoring network is to support compliance with ambient air quality standards and emissions strategy development, as provided by 40 CFR Part 58, Appendix D, Section 1.1(b).

Response 4: Due to the defined scope of this document, only PAMS-related VOC monitoring is included in this plan. PAMS monitoring objectives include collecting data to evaluate and support air quality model development and O_3 precursor concentration trend assessment for O_3 NAAQS attainment efforts. No current federal PAMS VOC or $PM_{2.5}$ monitoring requirements are applicable for the Gregory-Portland area; however, the TCEQ will continue to evaluate the need for additional area monitors, including pollutants other than PM_{10}.

The TCEQ notes that three new air monitoring stations have been deployed in the Gregory-Portland area through a public-private partnership between area industry, the Gregory-Portland ISD, the University of Texas at Austin, and independent monitoring contractors. These three air monitoring stations, located at the Gregory High School, Stephen F. Austin Elementary, and at the Old East Cliff Elementary School, measure $PM_{2.5}$, NO_x, SO_2, and 46 speciated VOCs. Data from the stations are provided on a publicly available website, https://gpair.ceer.utexas.edu/. Per the partnership, the University of Texas at Austin provides independent air monitoring data analyses and ensures data are obtained using methods and quality assurance protocols that meet or exceed EPA's air quality monitoring requirements.

Comment 5: Sierra Club et al. commented that there is a compelling need for additional VOC monitors along the Houston ship channel, an area with concentrated operations, to protect the public from cumulative risks. The commenters referenced Texas Water Code language regarding giving priority to monitoring in areas where regulated facilities are concentrated, Texas Water Code Part 5.130. Sierra Club et al. commented that recent data indicate possible systematic air emissions underreporting errors by facilities along the channel and noted that some communities along the channel are exposed to greater pollution than others. The commenters also noted that daily unauthorized emissions are compounded by the steady stream of preventable disasters at channel facilities The commenters stated that the chronic allowable emissions exceedances render the TCEQ air permit review process incapable of protecting public health because the technical assumptions upon which air permits are issued likely underestimate actual pollution levels and that enhanced VOC monitoring in the Houston Ship Channel communities is necessary to fill regulatory gaps.

Sierra Club et al. commented that no VOC monitors are located along the Houston ship channel on the southbound side of Interstate Highway 610 and requested that a

VOC monitor be placed near JR Harris Elementary school. Commenters also requested additional monitoring in Manchester, Pasadena, Deer Park, and Baytown.

Response 5: As previously stated, this plan addresses federally required monitoring and demonstrates the TCEQ's compliance with requirements under 40 CFR Part 58. The AMNP was not developed to address monitoring objectives required or authorized by the Texas Water Code.. Due to this defined scope, only PAMS-related VOC monitoring is included in this plan. PAMS monitoring objectives include collecting data to evaluate and support air quality model development and O_3 precursor concentration trend assessment for O_3 NAAQS attainment efforts. The TCEQ is required to have one Houston Metro area PAMS autoGC for speciated VOCs at the TCEQ National Core Multipollutant Network (NCore) site, Houston Deer Park number (#) 2. The TCEQ operates two additional area autoGCs at Clinton and Channelview, exceeding federal PAMS VOC monitoring requirements.

The TCEQ also operates a robust network of state-initiative monitors that support a variety of purposes. Even though the TCEQ state-initiative monitors are outside of the scope of this document, this state-initiative monitoring network provides valuable information for assessing public health. Data from these state-initiative monitors are located on the TCEQ TAMIS webpage (https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome). The TCEQ is significantly enhancing its state-initiative air monitoring capabilities along the Houston ship channel by deploying three new autoGC sites to monitor air toxics. The new autoGC air monitors, capable of continuous measurement of 46 volatile organic compounds, are currently planned for the Channelview/Jacinto Port, Manchester, and Pasadena communities. Locations have been identified and site construction activities are underway with monitoring anticipated to begin by the fall of 2020. While an autoGC is not planned at the John R Harris Elementary School, the TCEQ will be placing an autoGC at the Manchester/Central air monitoring site located one mile to the east of the school. The TCEQ is also collaborating with Houston Regional Monitoring Corporation (HRM) to make VOC monitoring data at their monitoring stations publicly available via TAMIS. This will include data from an existing autoGC at HRM Site 16 in Deer Park and a new autoGC to be placed at their existing HRM Site 7 in Baytown (HRM information and site locations are provided at http://hrm.aecom.com/index.htm). The Houston Deer Park area is already supported by an autoGC at the TCEQ Houston Deer Park #2 air monitoring site. The new state-initiative equipment and collaboration will expand TCEQ's ability to rapidly assess air quality and will help with daily monitoring of ambient conditions in the Houston ship channel and surrounding areas.

Comment 6: Sierra Club et al. commented that the TCEQ must add additional O_3 monitors to the San Antonio area to provide air pollution data to the public in a timely manner, to show compliance with ambient air quality standards, support compliance with air quality standards and emissions strategy development, and to provide information about air pollution transport into, and outside of, a city or region, as provided by 40 CFR Part 58, Appendix D, Sections 1 (a), (b) and 1.1.1. The Sierra Club et al. commented that EPA's decision to designate Atascosa, Comal, and Guadalupe counties as attainment/unclassifiable is currently the subject of litigation before the United States Court of Appeals for the Fifth Circuit, and that regardless of

how this litigation is resolved, TCEQ must add additional O_3 monitors in the San Antonio area. The Sierra Club et al. commented that the TCEQ should also add O_3 monitors in surrounding counties, at a minimum in New Braunfels, due to the approximate population of 300,000 in Guadalupe and Comal counties and increasing population growth rate in Comal County between 2017 and 2018. In addition, Sierra Club et al. commented that TCEQ should add an O_3 monitor north of the San Miguel Electric Plant to help assess the potential impact on Bexar County air quality.

Response 6: The TCEQ is federally required to operate a minimum of two O_3 monitors in the San Antonio-New Braunfels Metropolitan Statistical Area (MSA), based on the most recent MSA population estimates and the three-year O_3 design value, and currently operates three O_3 monitors: one upwind and one downwind of the greater San Antonio area and one downwind of city center, illustrated in Figure 1, below, with O_3 monitors noted by a light blue section. The data from these three monitors are provided to the public in a timely manner (see Response 3), support compliance with ambient air quality standards and emissions strategy development, support air pollution research studies, and provide information about air pollution transport into and around the area. The San Miguel Electric Plant is located in Atascosa County. The counties of Atascosa and Bexar are delineated by the U.S. Office of Management and Budget (OMB) under the San Antonio-New Braunfels MSA. The TCEQ exceeds O_3 monitoring requirements in this MSA, as noted above.

The TCEQ recently strengthened its O_3 precursor monitoring efforts by adding two upwind NO_x monitors at the Floresville Hospital Boulevard and Karnes County monitoring sites (downwind of the Eagle Ford Shale area) to its federal program, as noted in the 2020 AMNP. Additionally, as a part of the TCEQ state-initiative network, two autoGCs measuring VOCs operate at these same sites (state-initiative monitors are not pictured in Figure 1 below), further supporting emissions strategy development.

Local and industry entities also support additional O_3 monitoring (not pictured in Figure 1) with nine non-regulatory monitors (these monitors do not meet criteria specified in 40 CFR Part 58 for data evaluation) spread throughout the region in Bexar, Comal, and Guadalupe counties. Even though the data from these non-regulatory monitors do not meet requirements for comparing the data to the NAAQS, the TCEQ considers the data as supporting information for the area's air quality decisions. Data from these additional O_3 monitors are located on the TCEQ TAMIS webpage (https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome).

The TCEQ does not agree with the comment that O_3 monitors should be added to New Braunfels due to the combined populations of Comal and Guadalupe Counties and the recent population growth rate. Federal monitoring requirements for O_3 outlined under 40 CFR Part 58, Appendix D, Section 4.1(a) apply specifically to MSAs. MSAs are delineated by the OMB and used by the Census Bureau when reporting population estimates. The OMB delineated the San Antonio-New Braunfels MSA as containing multiple counties, including Comal and Guadalupe. Federal O_3 monitoring requirements are triggered by the MSA population based on the latest available census figures (see 40 CFR Part 58.50(c) and Table D-2 of Appendix D to Part 58). The individual county populations of Comal and Guadalupe do not trigger additional O_3

monitoring requirements.

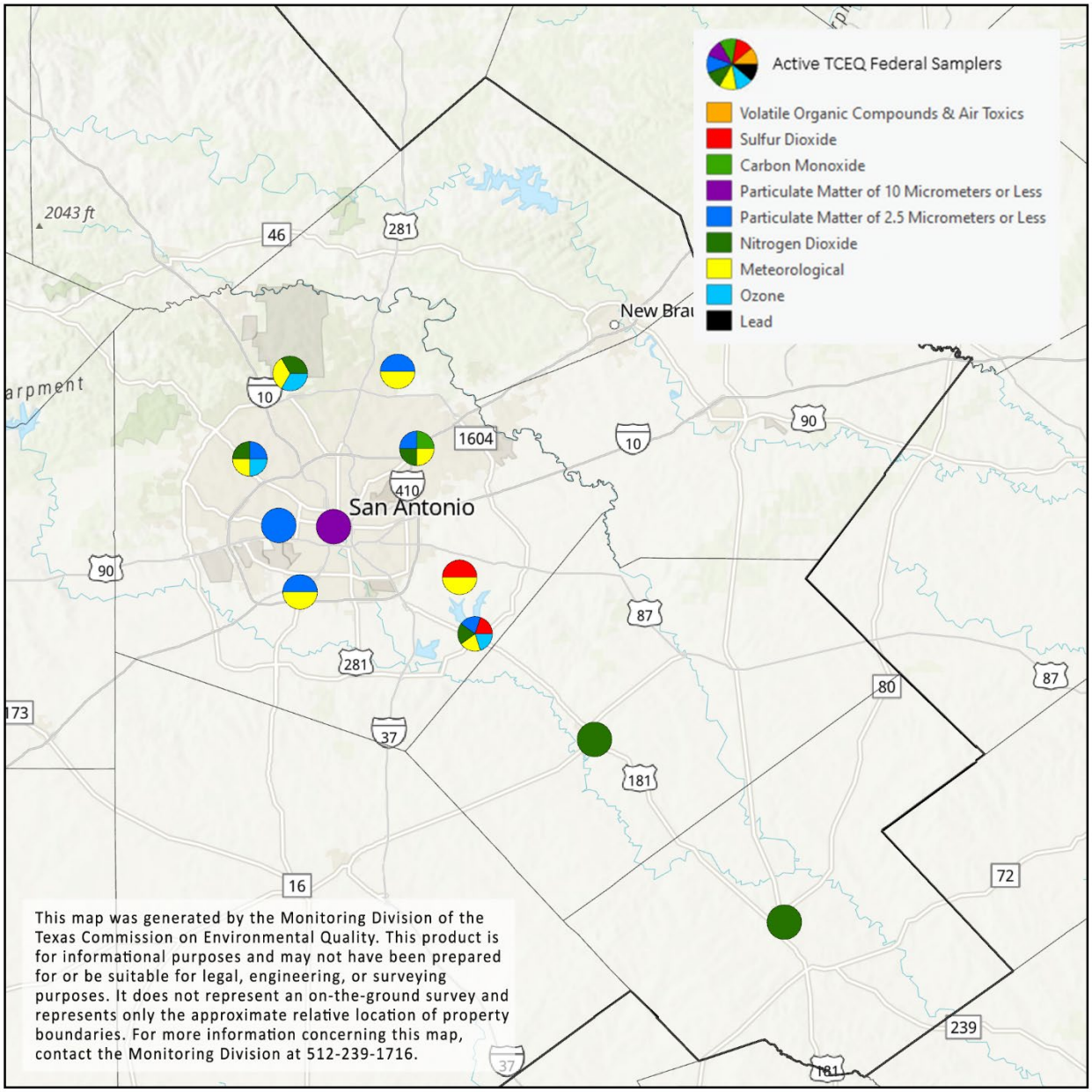


Figure 1: San Antonio Area Active Sites and Monitors

Comment 7: Sierra Club et al. commented that the TCEQ should use population data for the Midland-Odessa combined statistical area (CSA) composed of Martin and Midland Counties (Midland MSA) and Ector County (Odessa MSA) to determine O_3 federal monitoring requirements and that the population of the Midland-Odessa CSA is expected to be higher than 350,000 in 2020 if population growth rates remain constant. The commenter stated that failing to consider Midland and Odessa as a single unit would be arbitrary and capricious. Other metropolitan areas that span much greater distances are treated as a single unit for the purpose of 40 CFR Part 58,

Appendix D, Section 4.1,Table D-2, and that regardless of whether TCEQ treats Midland and Odessa as separate units for purposes of Table D-2, the end result is the same: two O_3 monitors must be added because both MSAs have more than 50,000 people. Sierra Club et al. further commented that EPA regulations require consideration of the entire CSA for air quality network design if multiple MSAs are involved, 40 CFR Part 58, Appendix D, Section 4.1(b). Sierra Club et al. also commented that the total number of monitoring sites needed to support monitoring objectives will require more sites than minimum requirements, 40 CFR Part 58, Appendix D, Section 4.1. Sierra Club et al. additionally commented that Midland and Odessa each have a population greater than 50,000, and the nearest O_3 monitor in Hobbs, New Mexico has a design value greater than 85 percent (%) of the NAAQS. Sierra Club et al. asserts that two O_3 monitors must be added, one in the Midland MSA and the second in the Odessa MSA.

Response 7: The TCEQ does not agree with these comments. Minimum federal monitoring requirements for O_3 outlined under 40 CFR Part 58, Appendix D, Section 4.1(a) apply specifically to MSAs. According to the final rule, 71 *Federal Register* 61,236 (October 17, 2006), page 61,267, the EPA investigated the current network compared with using either CSA or MSA as the basis for applying the minimum network requirements. The results demonstrated that using MSA would ensure a few more sites in the small number of large CSAs that have high populations and large geographical areas without unnecessarily requiring new sites. Since using MSAs would not impose a significant new burden on the States and would make it more likely that within-MSA gradient characterization of O_3 would be characterized in high concentration areas, EPA adopted MSA as the appropriate unit of a metropolitan area to apply to the minimum O_3 monitoring requirements. In addition, while the final rule required fewer O_3 monitors, the EPA did not intend to encourage net reductions, however intended the surplus in the existing networks relative to minimum requirements to give States more flexibility to choose where to apply O_3 monitoring resources. The final rule further states that the EPA will work with each State to determine what affordable monitoring activities above minimum requirements would best meet the diverse needs of the program as well as the needs of other data users. The EPA Region 6 concurred with the TCEQ monitoring activities as listed in the 2019 AMNP and the TCEQ concludes that the approved monitoring activities meet the diverse needs of the TCEQ program and data users.

Further, 40 CFR Part 58, Appendix D, Section 4.1(b), in regards to utilizing CSA information if multiple MSAs are involved, is related to siting an O_3 monitor (if required) and recording the maximum concentration for an area, and is not related to requiring the number of monitors for an area, which is detailed in 40 CFR Part 58, Appendix D, Section 4.1(a) (based on MSA populations).

MSAs are delineated by the U.S. OMB and used by the Census Bureau when reporting population estimates. The OMB delineated the Midland MSA as containing Midland and Martin Counties and a separate Odessa MSA as containing Ector County. Federal O_3 monitoring requirements are triggered by the MSA population based on the latest available census figures (see 40 CFR Part 58.50(c) and Table D-2 of Appendix D to Part 58). The Midland and Odessa individual MSA populations do not trigger O_3 monitoring for MSA populations with greater than 350,000 persons. Hobbs, New

Mexico, is delineated by the OMB as a micropolitan statistical area and is not associated with the Midland or Odessa MSAs. Comments related to out-of-state, micropolitan area design values are beyond the AMNP scope.

Comment 8: The Sierra Club et al. commented that the TCEQ must model SO_2 levels in Ector County and the remainder of the Permian Basin and install monitors at expected hot spots to serve the purposes of air pollution monitoring. Sierra Club et al. further commented that if modeling or monitoring showed violations of the NAAQS, TCEQ must take actions to fix them. The Sierra Club et al. urged the TCEQ to revise the AMNP to include air quality monitoring around oil and gas productions where flaring and venting is well-documented. The Sierra Club et al. also commented that the most immediate need was for VOC, SO_2, and hydrogen sulfide monitors, and that placing an O_3 monitor and an additional PM monitor in the Odessa-Midland area was also important. The Sierra Club et al. appreciated that the TCEQ had to make hard choices about where to measure air quality in Texas and that due to the most recent oil bust, urged TCEQ to take action and protect air quality in the oil and gas producing regions of the state.

Response 8: The TCEQ appreciates the Sierra Club et al. acknowledgment regarding the difficult choices on air quality monitoring location with limited resources. The purpose of the 2020 AMNP is to demonstrate how the TCEQ air monitoring network complies with federal monitoring requirements detailed in 40 CFR Part 58. TCEQ meets or exceeds federal monitoring requirements for MSAs in the Permian Basin area as detailed in the 2020 AMNP and in Appendix C of this plan.

Although no additional monitoring is included in this AMNP for the Permian Basin, the TCEQ is in the process of deploying three new air monitoring sites in Goldsmith, west Odessa, and Midland as a state initiative. The new air monitoring sites, anticipated for deployment by the fall of 2020, will monitor for VOC, SO_2, and hydrogen sulfide. No additional PM or O_3 monitoring are planned at this time. Comments related to modeling and actions to fix NAAQS violations are outside the scope of this plan.

Comment 9: The Sierra Club et al. commented that the TCEQ submitted modeling data for seven of the 25 sources subject to the Data Requirements Rule (DRR) and now suggests that it can demonstrate attainment for the other sources through monitoring. Sierra Club et al. further commented that the TCEQ failed to meet the deadline to notify the EPA by July 1, 2016 of the sources that it intended to characterize using monitoring and as such was required to demonstrate attainment through modeling.

Response 9: The TCEQ does not agree with these comments. Air agencies were given the option to model or monitor emissions impacts from sources subject to the DRR. The TCEQ's SO_2 monitoring plan is in compliance with the options and requirements in the DRR and 40 CFR Part 58, Appendix D, Section 4.4.2. The EPA promulgated a schedule in which July 1, 2016, was the deadline for selecting between monitoring, modeling, or establishing source emission requirements. The 2016 AMNP included proposed SO_2 monitoring locations for the characterization of air quality relevant to specific DRR sources required to be operational by January 1, 2017. The EPA

subsequently approved these monitoring locations and all were operational by the January 1, 2017, deadline. The TCEQ met all DRR deadlines including EPA notification regarding the monitoring plan to characterize air quality by July 1, 2016.

Comment 10: The Sierra Club et al. commented that TCEQ's plan to deploy an extensive monitoring network as a part of the implementation of the SO_2 NAAQS suffers from drawbacks that render this approach too slow, too impractical, and too ineffective for monitoring to replace modeling as the primary means of implementing the 2010 one-hour SO_2 NAAQS.

Response 10: The TCEQ does not agree with these comments. Title 40 CFR Part 51.1201 states that air agencies could model or monitor to characterize maximum one-hour SO_2 concentrations from sources subject to DRR requirements. The TCEQ's SO_2 monitoring plan is in compliance with these requirements. The TCEQ continues to support the use of ambient air monitoring data, as appropriate, for making designation decisions.

Comment 11: The Sierra Club et al. commented that the TCEQ 2020 (and 2019) AMNP fails to demonstrate that the current SO_2 monitors are placed in a location and manner that captures the peak predicted emissions concentrations as required by EPA regulations. The Sierra Club et al. provided examples for model predicted peak impacts for the Martin Lake and Harrington power plants and noted that peak impacts were not predicted in the TCEQ monitor locations, and that the TCEQ thus failed to site source-oriented monitors in locations with the highest predicted SO_2 concentrations. In addition, the Sierra Club et al. commented that even though the monitors were incorrectly sited, the monitoring data from monitors located near the Martin Lake and Harrington power plants are exceeding the health-based SO_2 NAAQS and that if 2019 air quality monitoring continues to demonstrate violations of the standard, the TCEQ must take appropriate action, including adoption of enforceable emission limits near both power plants or recommend that the EPA redesignate the areas as nonattainment for the 2010 SO_2 NAAQS. The Sierra Club et al. urged the TCEQ to install additional air quality monitors in these areas to properly characterize ambient air quality near those plants and to inform the affected communities.

Response 11: The TCEQ does not agree with these comments. Details relating to the site evaluation and selection process (monitor placement evaluations) for DRR source-oriented monitors were outlined in the TCEQ 2016 and 2017 AMNPs, and continued to be reflected in subsequent AMNPs, with which EPA concurred. As detailed in these AMNPs, the site evaluation and selection process considered the peak modeled impacts along with other monitor siting criteria, including power availability, site access, and 40 CFR Part 58, Appendix E siting criteria requirements. Based on the information provided in the monitor placement evaluations, the EPA approved the monitor placement for Harrington Station and Martin Lake Electrical Station. The TCEQ is meeting all regulatory SO_2 requirements in the DRR and in 40 CFR Part 58, Appendix D, Section 4.4.2.

The TCEQ does not agree with the commenter's assertion that additional air quality monitors are needed in these areas to properly characterize ambient air quality. Further, enforceable emission limits and area designations are not components of the

AMNP review required under 40 CFR Part 58.10 and are beyond the scope of this plan.

Comment 12: The Sierra Club et al. commented that the TCEQ should conduct additional modeling to reevaluate compliance with the SO_2 NAAQS at WA Parish, San Miguel, and Coleto Creek due to increased facility SO_2 emissions according to the TCEQ *2020 Sulfur Dioxide Ongoing Data Requirements Annual Report*. The Sierra Club et al. stated that the original area designation modeling analysis was not in TCEQ monitoring network rulemaking record and that the dispersion modeling analyses did not actually reflect total annual emissions but reflected emission rates evaluated to demonstrate compliance with the hourly standard and that this modeling does not ensure compliance with the one-hour SO_2 NAAQS. The Sierra Club et al. stated that the conclusory explanation for not conducting additional modeling or monitoring is insufficient, that the TCEQ should conduct additional modeling based on the most recent three years of actual hourly emissions or should impose more stringent emissions limitations under 40 CFR Part 1204 to ensure compliance with the standard.

Response 12: The TCEQ does not agree with these comments. The original designation modeling analysis was not a required portion of DRR monitor siting and is outside the scope of this plan. Title 40 CFR Part 51.1205(b) requires agencies to submit an annual ongoing data requirements report to the EPA documenting each applicable DRR source's annual SO_2 emissions for areas designated attainment/unclassifiable for the 2010 one-hour SO_2 NAAQS where the designations were based on modeling actual SO_2 emissions; and to provide an assessment of the cause of any emissions increase from the previous year. The TCEQ has fulfilled this federal requirement with the report in Appendix F.

In the EPA's preamble to the data requirements rule, the EPA recommended that agencies should conduct additional modeling for an area if the original modeling level was equal to or greater than 90% of the standard, or, if the original modeling level was between 50-90% of the standard, and emissions in the area increased by 15% or more. The preamble also stated that in other cases where air quality has been modeled to be well below the standard and annual emissions increased only slightly in the following year, the air agency would be able to exercise judgment regarding whether additional modeling would be needed. Since the original modeling results for the San Miguel Power Plant reviewed by EPA to make an attainment determination were 57% of the standard and the annual emissions increase in 2018 were 1.7%, no additional modeling is necessary. The very small increase in emissions from the original designation modeling inputs would not be expected to change the attainment/unclassifiable designation and the area would be expected to continue meeting the 2010 one-hour SO_2 NAAQS. Additionally, as stated in AMNP Appendix F, the emissions inventory comparison for Coleto Creek and WA Parish show that the original designation modeling evaluated higher average emissions, providing reasonable assurance that these three areas continue to meet the 2010 one-hour SO_2 primary NAAQS. The TCEQ continues to recommend that no additional SO_2 air quality modeling is needed to determine compliance with the 2010 SO_2 NAAQS for any of the seven Texas counties listed in AMNP Appendix F, including the areas around WA Parish, San Miguel, and Coleto Creek.

The imposition of more stringent emission limits are outside the scope of the AMNP.

Comment 13: The Sierra Club et al. commented that the TCEQ should require Western Refining (in the El Paso area) to implement real-time emissions fence-line monitoring so that residents and emergency personnel can be alerted of exceedances in time to take appropriate response measures and should require Western Refining to conduct a health impact study of the Sambrano neighborhood to determine if residents are suffering adverse health effects due to hydrogen cyanide or other emissions.

Response 13: The purpose of the 2020 AMNP is to demonstrate how the TCEQ air monitoring network complies with federal monitoring requirements detailed in 40 CFR Part 58. The commenter's requests to require fence-line emission monitoring, exceedance alerts, and health impact studies are not required elements under 40 CFR Part 58 and are outside the scope of the AMNP.

Comment 14: The Sierra Club et al. commented that the TCEQ misread the near-road regulations and that a near-road monitor was required in the El Paso-Las Cruces Core Based Statistical Area (CBSA), including El Paso and Hudspeth counties, Texas and Dona Ana County, New Mexico, due to an estimated population in excess of 1,000,000, and recommended that the site be located at Zavala Elementary School adjacent to Interstate 110 Spur.

Response 14: The TCEQ does not agree with these comments. Title 40 CFR Part 58, Appendix D, Section 4.3.2, requires that near-road monitors be placed in applicable CBSAs. The OMB defines the El Paso CBSA as El Paso and Hudspeth Counties. The El Paso-Las Cruces area, referenced in the comment, is defined by the OMB as a combined statistical area or CSA, which is not applicable to near-road monitoring requirements. The EPA has concurred with the TCEQ review of Texas CBSA populations in past TCEQ AMNPs to assess and establish the required near-road monitors. The TCEQ is meeting federal requirements for near-road monitors.

Comment 15: More than 140 individual commenters, some of which commented on behalf of multiple members, Action Network on the behalf of 18 petitioners, and Achieving Community Tasks Successfully (ACTS) were in favor of, and strongly supported the proposed new particulate matter of 2.5 micrometers or less ($PM_{2.5}$) monitor in west Houston and expressed this was a crucial first step toward addressing pollution and protecting health and that more action was needed. The commenters noted that according to a Harvard School of Public Health (Harvard) and EDF analysis, there was widespread exposure to $PM_{2.5}$ air pollution across the Houston area in 2015. Houston commenters requested the TCEQ finalize the implementation of the new $PM_{2.5}$ monitor and take steps to install additional community monitors. Houston commenters stated that these data are needed, and the state needs to act to reduce air pollution and its harmful health impacts. One Houston commenter thanked the TCEQ for air monitoring investments throughout the last year. One Houston citizen commented that accurate air quality data were needed to determine when it was safe to be outdoors. One Houston citizen further commented that plumes spread west across Houston and that a monitor in west Houston will fill a data gap. The citizen also commented that the network should cover the entire

region, and that additional monitoring is long overdue and should be a budget priority. One Houston citizen was strongly in favor of installing a new $PM_{2.5}$ monitor in inner City Houston. One Houston citizen and employee of a large chemical corporation is strongly in favor of the new $PM_{2.5}$ monitor in west Houston and felt it will be critical to understanding the environmental community conditions necessary for making informed decisions. The commenter stated that corporate partners have a desire to ensure a high quality of life for their employees, friends, and communities, but that good data are needed for effective environmental management. The commenter also thanked the TCEQ for its efforts and strongly encouraged the work to expand.

Response 15: The TCEQ appreciates the support for the proposed $PM_{2.5}$ monitor at the Houston Westhollow air monitoring site to improve spatial coverage for west Houston. Houston $PM_{2.5}$ monitoring began in the late 1990s and expanded over time to include 13 area $PM_{2.5}$ monitors to measure ambient $PM_{2.5}$ concentration data through gravimetric, speciation, and continuous measurements to determine maximum concentrations, concentrations in areas of high population density, and background and transport concentrations. Data from these monitors are available to the public on the TCEQ TAMIS website (https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome). Daily air quality forecast and alert subscriptions are also available to the public for personal risk assessment (https://service.govdelivery.com/accounts/TXTCEQ/subscriber/new). The TCEQ exceeds the federal requirement of eight $PM_{2.5}$ monitors for the Houston area. The current TCEQ air monitoring sites and monitors in the Houston area are illustrated in Figure 2, $PM_{2.5}$ monitors are shown with a dark blue section, and all air monitoring sites and monitors are detailed in Appendix B of the 2020 AMNP. Future Houston area monitoring plans include adding a $PM_{2.5}$ continuous monitor to the Houston North Wayside air monitoring site, to improve population exposure coverage just northeast of Interstate Loop 610. This monitor is expected to be operational soon. There are no current plans to deploy a $PM_{2.5}$ monitor in the Houston inner-city area, however, the TCEQ will continue to assess the availability and distribution of $PM_{2.5}$ monitoring resources across the Houston area.

The Houston area $PM_{2.5}$ annual and 24-hour $PM_{2.5}$ design values continue to decline, indicating improving $PM_{2.5}$ concentrations. Figure 3 shows the annual mean and 24-hour 98th percentile $PM_{2.5}$ design value trends in the Houston area from 2006 through 2018 and Figure 5 shows the trends from 2002 to 2019. Data indicate that measured concentrations have consistently remained below the 24-hour $PM_{2.5}$ NAAQS of 35 micrograms per cubic meter (µg/m^3) since 2006. In addition, annual mean $PM_{2.5}$ concentrations have exhibited a decrease over this same time period with design values from all regulatory monitors remaining below the 12 µg/m^3 annual NAAQS since 2015.

Appendix M: TCEQ Response to Comments Received on the 2020 Annual Monitoring Network Plan

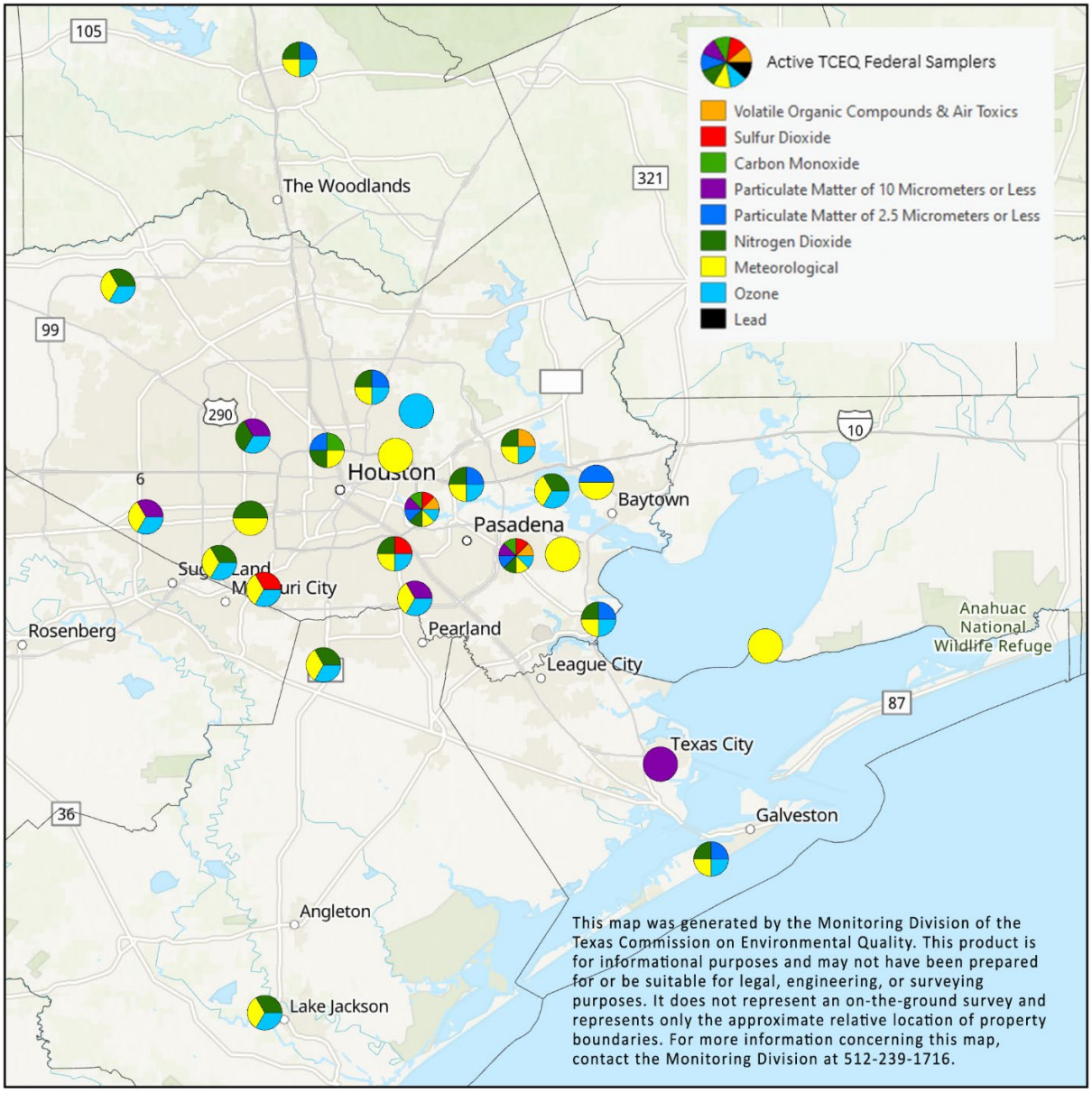


Figure 2: Houston Area Active Sites and Monitors

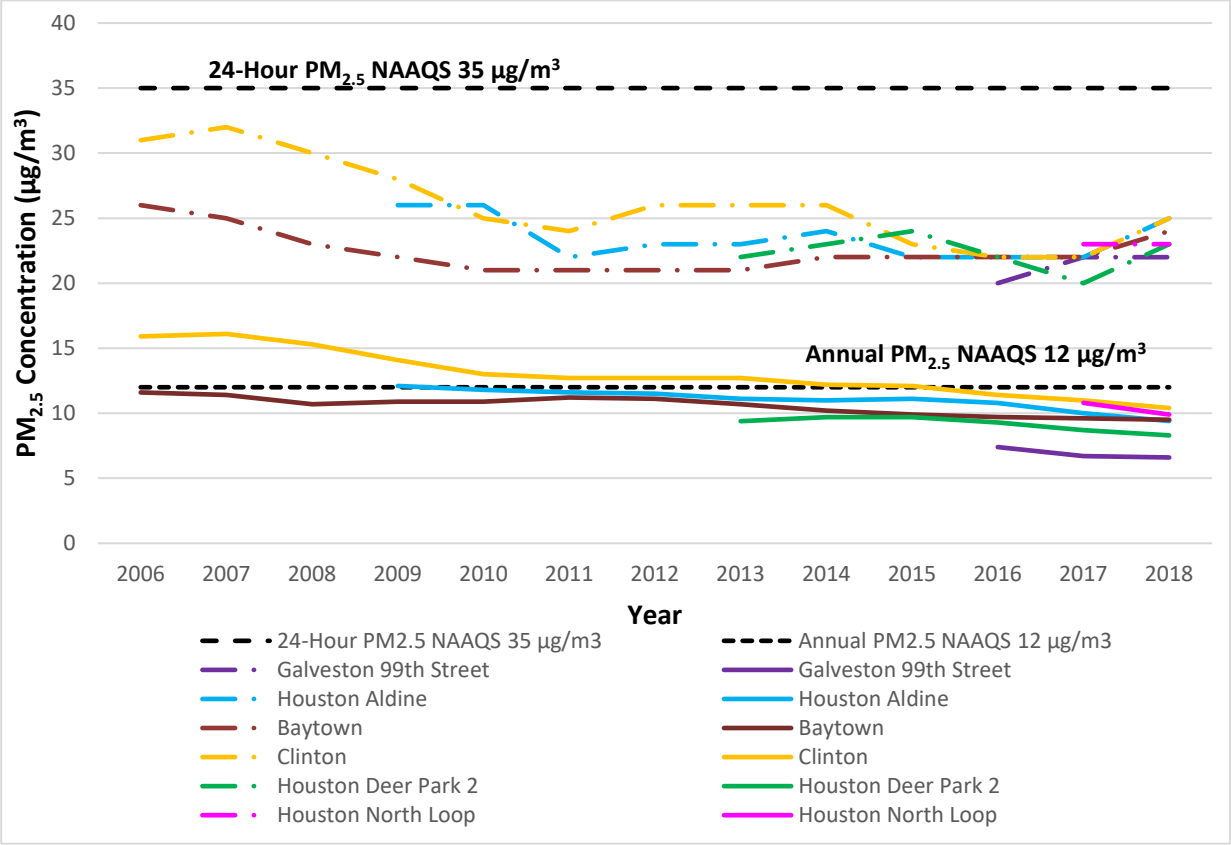


Figure 3: Houston Area Particulate Matter of 2.5 Micrometers or Less in Diameter 24-Hour and Annual Design Value Trends, 2006-2018

Comment 16: One Houston citizen commented that due to the coronavirus disease 2019 (COVID-19) stay at home orders, air quality has improved and recommended evaluating the areas that are most affected in an effort to maintain those levels after stay at home restrictions loosen. One Houston citizen commented that people exposed to chronic air pollution are more likely to become sick and/or die from COVID-19 and that more needs to be done to reduce air pollution and racial/neighborhood disparities. One citizen commented that pollutants create disparities in who is likely to die and that data demonstrated potential links between cancer, poor air quality, and the chemicals in Houston. One Houston citizen commented that COVID-19 outcomes are negatively correlated with air pollution and more monitoring was needed. One citizen commented that the 2020 AMNP was insufficient to protect human health, particularly in respect of the COVID-19 pandemic and the Harvard School of Public Health research report that exposure to fine particulate matter ($PM_{2.5}$) could be related to premature death arising from COVID-19.

Response 16: As stated in the introduction, the 2020 AMNP is intended to demonstrate the TCEQ's compliance with federal air monitoring requirements under 40 CFR Part 58. Comments related to the relationship between air pollution and COVID-19 impacts on public health are outside the scope of this plan.

Comment 17: One Houston citizen with the Dyer Forest Heights Civic Club and the

Air Alliance Organization requested that more air monitors be supplied to them due to nearby sandpits, rock crushing, and concrete plants that compromise children, the elderly, and those with underlying conditions.

Response 17: The AMNP is required to demonstrate compliance with federal air monitoring requirements. Based on the monitoring objectives, these monitors are generally located to represent area-wide regional ambient air quality and are not sited to evaluate specific sources. The TCEQ ambient air monitoring program monitors are property of the state and cannot be supplied to other entities.

Comment 18: One Houston citizen commented that Houston area air quality was toxic and dangerous, and more monitoring is needed to understand the extent of the problem so that policies could be made to address pollution in and around the city. One citizen said that four generations of their family have lived in Houston and have watched the air quality decline.

Response 18: The TCEQ acknowledges the commenter's assertion that more monitoring is needed. The AMNP is limited to those monitors within the TCEQ's monitoring network that are required to demonstrate compliance with federal air monitoring requirements and does not represent all monitors TCEQ operates or receives data from. The TCEQ meets or exceeds all federal monitoring requirements in the Houston area and conducts extensive state initiated monitoring not required by federal rule.

Comment 19: ACTS further recommended that the proposed $PM_{2.5}$ monitor in west Houston be approved and added in 2020 and noted that the city needs more monitoring and resources should not be shifted but added.

Response 19: The TCEQ appreciates the support of the proposed $PM_{2.5}$ monitor at the Houston Westhollow air monitoring site to improve spatial coverage for west Houston. The 2020 AMNP recommended adding this monitor by December 31, 2020, and will be completed once EPA concurs. The TCEQ continually assesses its ambient air monitoring network and takes into consideration changes in population and air emission sources, and changes in observed air quality data over time. When appropriate and feasible to do so, additional monitoring resources may be added; however, the TCEQ strives to balance the need for additional monitoring with limited resources, and re-allocating resources that are no longer needed in other areas helps maximize the use of the agency's available monitoring assets. Additional NO_x, O_3, and multiple particulate matter monitors are planned for the Houston area in 2020 as detailed in this plan.

Comment 20: The City of Houston Mayor, Sylvester Turner, commented that the recent analysis by Harvard and the EDF revealed that 2015 Houston area particle pollution may have contributed to premature deaths and economic damages. The Mayor commented that the satellite data from the Harvard analysis identified a plume of particulate matter (PM) in west Houston. The Mayor commented that if monitors were spread spatially to cover west Houston, data may have indicated levels above federal limits. The Mayor commented that federal rules require monitors in areas with the highest level of soot and areas of greatest population exposure. The

Mayor further stated that TCEQ has failed to meet this obligation in west Houston and that the region needs more monitors to meet federal rules. The Mayor strongly encouraged the TCEQ to install a $PM_{2.5}$ monitor in west Houston.

Response 20: The TCEQ appreciates the support regarding the proposed $PM_{2.5}$ monitor to improve spatial coverage for west Houston. As discussed in Response 2, Houston area $PM_{2.5}$ monitoring has expanded over time to include 13 area $PM_{2.5}$ monitors to measure ambient $PM_{2.5}$ concentration data to determine maximum concentrations, concentrations in areas of high population density, and background and transport concentrations. Data from these monitors are available to the public on the TCEQ TAMIS website (https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=home.welcome). Daily air quality forecast and alert subscriptions are also available to the public for personal risk assessment (https://service.govdelivery.com/accounts/TXTCEQ/subscriber/new). The TCEQ exceeds the federal requirement, which is eight monitors, for the Houston area. In addition to the proposed $PM_{2.5}$ monitor in west Houston, other plans include adding a $PM_{2.5}$ continuous monitor to the Houston North Wayside air monitoring site, to improve population exposure coverage just northeast of Interstate Loop 610. This monitor is expected to be operational soon.

Comment 21: One citizen commented that the EPA has delegated monitoring and compliance of the Federal Clean Air Act (FCAA) to Texas and Texas has charged TCEQ with compliance of the FCAA. Several citizens commented that the TCEQ 2020 AMNP was insufficient to protect human health, safety and welfare in Comal County and across Texas. One citizen commented that the plan should ensure meaningful public participation in the decision-making process.

Commenters noted that the TCEQ operated a vast network of air monitors, but most were for O_3. Citizens commented that PM monitoring was insufficient and that PM monitoring failed to capture the components including respirable crystalline silica (RCS). One citizen commented that current air monitors are seldom set up to monitor PM of the sizes most detrimental to public health.

Response 21: As previously stated, the AMNP is required to demonstrate compliance with federal air monitoring requirements under 40 CFR Part 58 and does not include monitoring conducted by TCEQ as state initiatives. As detailed in Appendix C, the TCEQ meets and/or exceeds all federal monitoring requirements and the AMNP is made available for public inspection, comment, and revision as appropriate, in fulfillment of 40 CFR Part 58.10(a)(1).

The TCEQ operates an air monitoring network that monitors for the six criteria pollutants, including particulate matter, in accordance with 40 CFR Part 58. TCEQ operates 59 $PM_{2.5}$ monitors and 21 PM_{10} monitors throughout the state. Additionally, the TCEQ operates six $PM_{2.5}$ monitors to determine particulate matter components, termed speciation, that include lead and other metals, ions, and carbon fractions. In the San Antonio-New Braunfels MSA, the TCEQ operates a total of eight $PM_{2.5}$ monitors and three PM_{10} monitors, including a new monitoring station deployed in Comal County. Monitors and locations for federally- required TCEQ monitors are detailed in Appendix B. There are no federal guidelines in 40 CFR Part 58 to monitor for RCS,

therefore comments related to RCS are outside of the scope of this document.

Comment 22: Citizens commented that more PM monitors are needed within a reasonable distance from point sources, that data from numerous sources, including EPA satellite data, should be used to spot monitors in areas with high levels of PM, and that new monitors should measure $PM_{2.5}$, PM_{10} and the composition. Commenters noted that a large number of monitors do not run continuously, are not located correctly to provide upwind and simultaneous downwind data to use for modeling, and that decommissioning monitors would weaken an inadequate air program.

Response 22: As previously stated, the 2020 AMNP is intended to demonstrate the TCEQ's compliance with federal air monitoring requirements under 40 CFR Part 58 and its monitoring objectives which do not include monitoring emissions from specific sources or for the purpose of modeling. As detailed in Appendix C, the TCEQ air monitoring network meets and/or exceeds all federal monitoring requirements, and the placement of TCEQ stationary monitors are sited to meet the monitoring objective of assessing regional air quality. The TCEQ operates a variety of EPA approved monitors that provide PM continuous data or 24-hour sample data operated according to the prescribed EPA sampling schedule. As stated in Response 21, the TCEQ operates 59 $PM_{2.5}$ monitors and 81% of these are continuous monitors. All 21 TCEQ PM_{10} instruments are filter-based and operate according to the prescribed schedules listed in 40 CFR Part 58.12(e).

The TCEQ strives to balance the need for additional monitoring with limited resources, and re-allocating resources that are no longer needed in other areas helps maximize the use of the agency's available monitoring assets. Monitors may be decommissioned for a variety of reasons including when monitored pollutant data no longer supports the location's monitoring objective, issues with meeting siting criteria, or at the request of the property owner due to the sale of the property. As appropriate, the TCEQ works with nearby property owners to secure a new monitoring site to meet the same objectives.

Comment 23: Several citizens commented that the TCEQ did not use newer air technologies like National Aeronautics and Space Administration (NASA) satellite technology, TSI 8400, beta attenuation monitor (BAM) 1020, or purple air, and that these technologies show increasing trends in the amount of airborne particulates in regions where aggregate production operation facilities (APOs) operate. Citizens encouraged the TCEQ to use these technologies to determine problem areas that need more monitors. One citizen commented that impartial laboratories should be used, not companies hired by APOs.

Response 23: The TCEQ monitors ambient concentrations of specified air pollutants using instruments that meet EPA specifications under 40 CFR Part 53 to be designated as Federal Reference Method or Federal Equivalent Method monitors. More than half of the $PM_{2.5}$ monitors operated by the TCEQ are continuous BAM 1020 or the newer BAM 1022 models. As described in the 2020 AMNP, the TCEQ has plans to continue updating the network with an additional 15 BAM 1022 instruments in 2020 and 2021. NASA satellite technology, TSI 8400 sensors, and purple air sensors do not meet federal requirements and are outside of the scope of this document. The TCEQ

federal ambient air monitoring network, discussed in this plan, utilizes in-house laboratories and one contract laboratory. These laboratories are accredited through the National Environmental Laboratory Accreditation Program and follow federally required reference methods.

Comment 24: One citizen commented that if data were above standard levels, there should be a plan to get the levels in line with EPA regulations. One citizen requested TCEQ to take note of trends observed by newer technologies and regulate and enforce, accordingly.

Response 24: These comments do not relate to the TCEQ's compliance with federal ambient air monitoring requirements under 40 CFR Part 58. Comments regarding emissions reductions, regulation, and enforcement are outside the scope of this plan.

Comment 25: Commenters appreciated the new $PM_{2.5}$ and PM_{10} monitors in New Braunfels, but felt that the new PM monitors would not accurately capture data from nearby APOs and that current and long-term wind direction and APO location was not accounted for when the monitors were sited; it was requested for the TCEQ to present the APO, wind and other data used to site PM monitors.

Response 25: The TCEQ appreciates the acknowledgement regarding the state-initiative New Braunfels PM monitors recently deployed to assess regional air quality downwind of area rock quarries. Please note that these monitors were not federally-required and are therefore not included in this AMNP.

In assessing the proper placement for these monitors, the TCEQ evaluated wind measurements from the New Braunfels Municipal Airport from 2016 to 2018. This data indicated a predominant southerly flow ranging from the south-southwest to the south-southeast and with lesser wind flows from the north-northeast in the winter months. The New Braunfels Oak Run Parkway air monitoring site is positioned to capture PM from area sources during south-southwest flows.

When choosing locations for new air monitoring stations, the TCEQ uses recent multi-year average wind rose data from the nearest airports and takes into consideration area sources and monitoring objectives. Air monitoring locations must have access to electricity, meet federal siting criteria listed in 40 CFR Part 58, Appendix E, (all monitoring inlets must be a distance at least two times the height of obstacles such as buildings or trees) provide safe access for staff and equipment, and provide enough space for multiple instruments, the necessary shelters and a meteorological tower. Potential site locations are thoroughly vetted and those deemed viable move forward with negotiations for site access. Potential site locations closer to source facilities do not always meet siting criteria or have willing property owners. TCEQ ambient air monitoring locations require significant resources and are thoroughly researched and evaluated to ensure monitoring objectives are met prior to final deployment.

Comment 26: One citizen commented their biggest concern and reason for submitting public comment was due to the unregulated and unabated growth in the APO industry. Several citizens commented that there were multiple APOs that own

over 7% of the property in Comal County. One citizen commented that homes are closely located to the permitted APO mining site in Comal County and that their home is in harm's way. Several citizens commented that permit related modeling is performed by consultants for the APOs and that only facility point-source emissions are used in permit related modeling; commenters noted that non-point source emissions other APO emission data (including APO mining operation data) and truck traffic emissions data are not included. Commenters noted that models are not calibrated with actual data and do not consider the components of PM. One citizen commented that because TCEQ grants permits based on modeling, models need to be ground-truthed to determine validity. Commenters noted that APO permit related dispersion modeling should be calibrated, and history matched, to include upwind and downwind monitors for dispersion modeling.

Several citizens requested that the TCEQ require APOs to include the Surface Mining Control and Reclamation Act (SMCRA) or similar mining best practices and to monitor PM emissions continuously on site and on surrounding properties to quantify and measure cumulative air quality impacts. Comments requested the TCEQ to implement a permitting program to include all APO activity and include air monitoring. One citizen commented that granting permits in the absence of monitoring was negligent and another commented that air permit dispersion modeling was deficient and needs to be addressed. Several citizens commented that TCEQ should require the APOs (at their expense) to measure continuous air quality at their sites and provide the data to TCEQ and the public. One citizen commented that there should be no ties to the aggregate industry and that core dirt samples should not be proprietary but should be validated by a third party.

Response 26: The intent of the AMNP is to demonstrate the TCEQ's compliance with federal air monitoring requirements rather than assessing the monitoring network in relation to specific sources such as permitted facilities. Comments related to the regulation of APO industry growth, home location in relation to permitted facilities, permit modeling and data inputs, facility emission monitoring, core dirt samples, and specific permitting matters are outside the scope of the AMNP.

Comment 27: One commenter stated that Kerr County was an area with several APOs that are close to schools, residential areas, summer camps, and a veteran's hospital and recommended targeted monitoring to support industries' good faith. The Commenter also noted problems such as a lack of dependable monitoring and modeling that does not reflect actual industry operations or the cumulative effect of nearby operations or traffic. The commenter noted there was no way to identify the good neighbors from operator's reckless practices and there was no accountability and worsening air quality and proposed potential solutions including: adding air quality monitors on all industry site perimeters specific to that operation and within one mile radius of prevailing winds; requiring monitor placement to be a part of the air permit application process; requiring applicants to pay for continuous monitoring; and requiring TCEQ to be in charge of data collection and evaluation to assure minimum health standards are met and each APO is adhering to their permit.

Response 27: The intent of the AMNP is to demonstrate the TCEQ's compliance with federal air monitoring requirements. Therefore, comments related to targeted

monitoring, permit modeling data inputs and other cumulative effects, fence line monitoring, and permit adherence are outside the scope of the AMNP.

Comment 28: One citizen submitted comments regarding the Vulcan quarry in Comal County, expressing concerns regarding automobile safety and road burden due to current traffic and expected increased truck traffic. The citizen further commented that the county had a high incidence of childhood asthma and that air quality health concerns were increased due to expected increased diesel exhaust pollutions, particulate flying off uncovered trucks, and windblown particulate from the quarry. The citizen also commented regarding water quality concerns and potential ecological damage the facility could spread to the Edwards Aquifer Recharge Zone and the Texas Hill Country. The citizen recommended the TCEQ to deny the Vulcan permit.

Response 28: The intent of the AMNP is to demonstrate the TCEQ's compliance with federal air monitoring requirements. Therefore, comments related to automobile safety and road burdens, water quality and ecological damage, emissions increases due to approved permits, and air permit approval are outside the scope of the AMNP.

Comment 29: One citizen was concerned about the air quality in the Schertz/New Braunfels area along the border of Comal and Guadalupe Counties and stated that dust falls on cars and that sometimes air pollution can be viewed from Interstate 35 along the escarpment. The citizen commented that people in the area suffer from asthma and sinus conditions and that Comal County air monitoring was limited and that constant truck traffic added to the pollution. The citizen requested more air monitoring sites in the industry intense area to maintain health. The citizen commented that long-term area sustainability depended on this information to determine whether further regulations are needed.

Response 29: The AMNP is intended to demonstrate the TCEQ's compliance with federal air monitoring requirements under 40 CFR Part 58. As detailed in Appendix C, the TCEQ meets and/or exceeds all San Antonio area (including Schertz and New Braunfels areas) federal monitoring requirements. In 2019, the TCEQ added additional PM monitoring in Bexar and Comal Counties to assess regional air quality and health concerns downwind of area rock quarries and mining facilities. The TCEQ will continue to assess the ambient air monitoring network to ensure compliance with federal monitoring requirements while balancing state and local monitoring needs.

Comment 30: One citizen requested an air quality monitor in the third ward of Houston due to many days of poor air quality in the area.

Response 30: As stated previously, the 2020 AMNP is intended to demonstrate the TCEQ's compliance with federal air monitoring requirements under 40 CFR Part 58. As detailed in Appendix C, the TCEQ meets and/or exceeds all Houston area federal monitoring requirements developed to provide public health protection, including protecting the health of sensitive populations. Figure 1 illustrates the federal Houston area air quality monitors. However, the TCEQ also operates a robust Houston area state-initiative network outside of the scope of this document. The TCEQ, in collaboration with the University of Houston (UH), operates a state-initiative air monitoring station in the Houston third ward. The UH Moody Tower air

monitoring station, located on the University of Houston campus, monitors for CO, NO_x, O_3, and SO_2 and the monitoring data are available to the public at https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=report.view_site&siteID=1011&siteOrderBy=name&showActiveOnly=1&showActMonOnly=1&formSub=1&tab=mons.

Comment 31: One citizen commented that air quality standards suffer in Texas from lack of action and that they were not in favor of more quarry or industrialized businesses near residential or farming areas. The commenter felt that violation standards and consequences were not heavy enough, that TCEQ has not pulled permits that would allow a facility to operate, and stated that the TCEQ has no teeth and no ability to enforce.

Response 31: These comments do not relate to the TCEQ's compliance with federal ambient air monitoring requirements under 40 CFR Part 58 and are outside the scope of this plan.

Comment 32: One citizen expressed disappointment with TCEQ actions and lack of actions during recent air permit public meetings and communications, specifically referring to Air Quality Permit number 147392L001, and stated that permits appear to be approved without comprehensive applicant in-depth studies regarding operational compliance history, violations, resulting fines and penalties. The commenter noted questionable statements made during public meetings. For example, Vulcan stated that they were in good standing with TCEQ during a public meeting, yet the commenter suggested that public records do not support this and that the Vulcan site received more violations than all other APOs in Bexar County combined. The commenter stated that the air permit does not require environmental impact studies or a review of potential traffic, safety and welfare issues, air quality concerns, and property devaluation and loss of intended use and further emphasized that it was a poorly written rule and regulation guidance. The commenter noted that air monitors should be required for APOs. The commenter suggested that monitoring costs should be paid by APOs and data certified through a third party.

Response 32: The intent of the AMNP is to demonstrate the TCEQ's compliance with federal air monitoring requirements. Therefore, comments related to air permit public meetings, environmental impact studies, APO required air monitors and subsequent monitoring costs are outside the scope of the AMNP.

Comment 33: One citizen commented to not allow further contaminants to pollute the air due to the current pandemic that is threatening the quality of public health. The citizen commented that there are not enough monitors to ensure the Vulcan Quarry will not destroy air quality.

Response 33: As stated previously, this AMNP is limited in scope to demonstrating compliance with federal air monitoring requirements under 40 CFR Part 58. The San Antonio-New Braunfels MSA, including Comal County, meets or exceeds federal monitoring requirements as detailed in the 2020 AMNP and in Appendix C of this plan. Air monitoring objectives determine site locations, and sites are generally placed to be representative of regional air quality, rather than monitoring emissions

from specific sources. Comments relating to emissions reductions or source compliance are outside the scope of this plan.

Comment 34: One citizen recommended that the TCEQ develop education plans to improve the public's understanding of air quality.

Response 34: The intent of the AMNP is to demonstrate the TCEQ's compliance with federal air monitoring requirements per 40 CFR Part 58. Therefore, comments related to public education regarding air quality are outside the scope of the AMNP. The TCEQ does provide information related to air quality at https://www.tceq.texas.gov/agency/air_main.html. The EPA also provides air quality information at https://www3.epa.gov/airquality/cleanair.html.

Comment 35: Public Citizen agrees with the recommendation to place a $PM_{2.5}$ continuous monitor at Houston Westhollow; however, feels it would be contrary to public health to decrease the sampling frequency of the Clinton and Houston Aldine $PM_{2.5}$ collocated Quality Control (QC) monitors since the sites have historically shown the highest $PM_{2.5}$ in the HGB area and have historically not recorded values in attainment of the NAAQS, even though $PM_{2.5}$ levels have decreased in recent years.

Response 35: Collocated quality control monitor data are required by 40 CFR Part 58 Appendix A, Section 3.2.3.4(d) to be collected on a 1-in-12-day schedule and are used to calculate and evaluate data precision; these data are not comparable to the NAAQS. The TCEQ is aligning the collocated Clinton and Houston Aldine $PM_{2.5}$ monitors with federal regulations and maximizing resources with no resulting reduction in federal monitoring data, as the primary samplers will continue to collect $PM_{2.5}$ samples on a daily schedule at Clinton and continuously at Houston Aldine.

Comment 36: Public Citizen commented that there are no stationary PM monitors that are sited with the intention of capturing PM concentrations from APOs, concrete and rock crushers, and concrete batch plants. Public Citizen recommended placement of one or more PM monitors sited to capture high concentrations from these facilities, including near concrete batch plants in Dallas or Houston and APOs in Central Texas. Public Citizen recommended collaboration with the Texas House Interim Study Committee on Aggregate production operations.

Response 36: As noted in the 2020 AMNP, the TCEQ will deploy $PM_{2.5}$ and PM_{10} monitors at the Houston North Wayside location and at a new air monitoring station in the Dallas southern sector to assess regional air quality downwind of area concrete batch and asphalt plants and a railyard. In 2019, the TCEQ added additional PM monitoring in northern Bexar and Comal Counties and in 2020, the TCEQ added PM monitoring in southern Bexar county and in Atascosa County to assess regional air quality and health concerns downwind of area rock quarries and mining facilities in those areas.

Comment 37: Public Citizen recommended SO_2 monitoring near WA Parish power plant, the 2nd largest SO_2 point-source in 2018, since the closest monitor is Houston Croquet which is located 14 miles away. Public Citizen further recommended reviewing SO_2 data from the University of Houston Sugar Land monitor, especially

during winter months when SO_2 levels typically peak, to evaluate if a regulatory SO_2 monitor is needed in the area for NAAQS violation review.

Response 37: As shown in the 2020 AMNP and Appendix E, the TCEQ exceeds all Houston area SO_2 monitoring requirements. The area around WA Parish power plant was designated attainment for the 2010 one-hour SO_2 NAAQS by the EPA based on emissions modeling, as provided by the DRR. The TCEQ continually assesses the ambient air monitoring network established to determine compliance with federal monitoring requirements specified in 40 CFR Part 58 and its appendices and will evaluate University of Houston Sugar Land non-regulatory SO_2 data for potential monitoring needs in 2021.

Comment 38: The Harris County Pollution Control Services Department (HCPC) recommends relocating the Baytown Garth SO_2 monitor to near one of the area's largest point source emitters, Exxon Mobil Baytown Refinery or Rohm and Haas's Deer Park plant instead of decommissioning it. Both plants emit over 1,000 tpy of SO_2 annually. HCPC recommended relocating the monitor near either plant to existing monitoring sites at C148 Baytown or C1036 Jacinto Port.

Response 38: The TCEQ appreciates the recommendation to reallocate the SO_2 monitor resource from the proposed Baytown Garth air monitoring site. As noted in the plan, TCEQ is currently exceeding federal requirements for SO_2 monitoring in the Houston area, but will further assess Houston area SO_2 needs again in 2021.

Appendix N

Comments Received on the 2020 Annual Monitoring Network Plan

Texas Commission on Environmental Quality
2020 Annual Monitoring Network Plan