2022-2023 Annual Monitoring Network Plan - Mecklenburg County Air Quality

Mecklenburg County Air Quality
A Division of the Mecklenburg County
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CERTIFICATION

By the signatures below, Mecklenburg County Air Quality (MCAQ) certifies that the information contained in the "2020-2021 Annual Monitoring Network Plan for Mecklenburg County Air Quality" is complete and accurate, to the best of our knowledge, at the time of submittal to USEPA Region 4. However, due to circumstances that may arise during the sampling year, network information may change. A notification of change and a request for approval will be submitted to USEPA Region 4 at that time.

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Air Quality Monitoring Manager, MCAQ

Print Name: Leslie Rhodes Signature: Leslie H. Rhodes Date: 6/27/2022

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2022- 2023 ANNUAL MONITORING NETWORK PLAN
MECKLENBURG COUNTY AIR QUALITY
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I. INTRODUCTION

The Mecklenburg County Air Quality (MCAQ) monitoring program, a division of the Mecklenburg County Land Use and Environmental Services Agency (LUESA); provides air quality monitoring services in Mecklenburg County, North Carolina. Mecklenburg County Air Quality is a state "certified local air pollution program" whose purpose is to improve and maintain ambient air quality and reduce exposure to unhealthy levels of air pollution.

MCAQ has operated an air quality monitoring program since the 1960's. The air monitoring services provided by the program measure concentrations of the criteria air pollutants (carbon monoxide - CO, nitrogen dioxide - NO_2, sulfur dioxide - SO_2, particulate matter - PM, lead - Pb, and ozone - O_3) in accordance with USEPA regulatory requirements.

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards or NAAQS (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards: 1) *Primary standards* set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly; and 2) *Secondary standards* set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants (criteria pollutants). The NAAQS are listed in Table 1:

National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
(4) The previous SO2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO2 standards or is not meeting the requirements of a SIP call under the previous SO2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Table 1.

The MCAQ air monitoring program operates a network of state and local air monitoring stations (SLAMS) in Mecklenburg County. The current network configuration consists of five monitoring stations that measure concentrations of criteria air pollutants, and the ongoing implementation of an additional Near-Road NO_2 monitoring station. The SLAMS network operated by MCAQ includes monitoring for criteria pollutants, meteorological parameters, NCORE multi-pollutant parameters, and speciation trends network (STN) monitoring. Occasionally, special purpose monitoring (SPM) is conducted.

The annual monitoring network plan, as stated in 40 CFR Part 58.10(b)(1-13), *Annual Monitoring Network Plan and Periodic Network Assessment;* must contain the following information for each existing and proposed site:

(1) The AQS site identification number.
(2) The location, including street address and geographical coordinates.
(3) The sampling and analysis method(s) for each measured parameter.
(4) The operating schedules for each monitor.
(5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
(6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.
(7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in §58.30.
(8) The MSA, CBSA, CSA or other area represented by the monitor.
(9) The designation of any Pb monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR part 58.
(10) Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.
(11) Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM_{10} monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.
(12) The identification of required NO_2 monitors as near-road, area-wide, or vulnerable and susceptible population monitors in accordance with Appendix D, section 4.3 of this part.
(13) The identification of any $PM_{2.5}$ FEMs and/or ARMs used in the monitoring agency's network where the data are not of sufficient quality such that data are not to be compared to the NAAQS. For required SLAMS where the agency identifies that the $PM_{2.5}$ Class III FEM or ARM does not produce data of sufficient quality for comparison to the NAAQS, the monitoring agency must ensure that an operating FRM or filter-based FEM meeting the sample frequency requirements described in §58.12 or other Class III $PM_{2.5}$ FEM or ARM with data of sufficient quality is operating and reporting data to meet the network design criteria described in Appendix D to this part.

This report constitutes the Mecklenburg County Air Quality "annual monitoring network plan" (ANP). The remaining sections of the plan are summarized below:

II. Station Description Background Information and Definitions: This section provides an overview and definition of "Station Description", "Date Site Established", "Station Approval Status", "Monitoring Objectives", "Monitoring Station Designations", "Monitoring Methods", "Quality Assurance Status", "Scale or Representativeness", and a "Data Processing and Reporting" summarization.

III. Network Summary: This section presents an overview of the sites and monitors in Mecklenburg County. It includes **a listing of proposed changes to the current network**.

IV. Air Monitoring Station Description: In this section each air monitoring station is described in detail.

II. STATION DESCRIPTION BACKGROUND INFORMATION AND DEFINITIONS

1. Station Description

Specific information is provided to show the location of the monitoring equipment at the site, if the site is in a combined statistical area (CSA), Core-based Statistical Area (CBSA), or Metropolitan Statistical Area (MSA), the AQS identification number, the GPS coordinates, and evidence that the stations monitors and monitor probes conform to the requirements of Appendices A, B, C, D, and E of 40 CFR 58, where applicable.

2. Date Established

The date when each existing monitoring station was established is shown in the description. For those stations, which are proposed, an expected startup date is provided.

3. Station Approval Status

Each monitoring station in the existing network has been reviewed with the purpose of determining whether it meets all design criteria for inclusion in the SLAMS network.

4. Monitoring Objectives

Per 40 CFR 58 Appendix D, Section 1.1: "The ambient air monitoring networks must be designed to meet three basic monitoring objectives. These basic objectives are listed below. The appearance of any one objective in the order of this list is not based upon a prioritized scheme. Each objective is important and must be considered individually.

(a) Provide air pollution data to the general public in a timely manner. Data can be presented to the public in a number of attractive ways including through air quality maps, newspapers, internet sites, and as part of weather forecasts and public advisories.

(b) Support compliance with ambient air quality standards and emissions strategy development. Data from FRM (Federal Reference Method), FEM (Federal Equivalent Method), and ARM (Approved Regional Method) monitors for NAAQS pollutants will be used for comparing an area's air pollution levels against the NAAQS. Data from monitors of various types can be used in the development of attainment and maintenance plans. SLAMS, and especially NCORE

station data, will be used to evaluate the regional air quality models used in developing emission strategies, and to track trends in air pollution abatement control measures' impact on improving air quality. In monitoring locations near major air pollution sources, source-oriented monitoring data can provide insight into how well industrial sources are controlling their pollutant emissions.

(c) Support for air pollution research studies. Air pollution data from the NCORE network can be used to supplement data collected by researchers working on health effects assessments and atmospheric processes, or for monitoring methods development work."

5. Monitoring Station Designations

Most stations described in the air quality surveillance network are designated as State and Local Air Monitoring Stations (SLAMS). The SLAMS include the ambient air quality monitoring sites and monitors that are required by 40 CFR 58 Appendix D and are needed for the monitoring objectives of Appendix D, including NAAQS comparisons, but may serve other data purposes. The SLAMS include National Core multipollutant monitoring stations (NCORE), photochemical assessment monitoring stations (PAMS), Chemical Speciation Network (CSN) / Speciation Trends Network stations (STN), and all other state or locally operated criteria pollutant monitors, operated in accordance with 40 CFR 58, that have not been designated and approved by the Regional Administrator as special purpose monitor (SPM) stations in an annual monitoring network plan. The following are descriptions of the SLAMS (including NCORE, PAMS, and STN) and SPM station designations.

(A) SLAMS: The SLAMS make up the ambient air quality monitoring sites that are primarily needed for NAAQS comparisons but may serve other data purposes. SLAMS exclude special purpose monitor (SPM) stations and include NCORE, PAMS, and all other state or locally operated stations that have not been designated as SPM stations. These stations must meet requirements that relate to four major areas: quality assurance, monitoring methodology, sampling interval, and siting of instruments and instrument probes.

(B) SPM: Not all monitors and monitoring stations in the air quality surveillance network are included in the SLAMS network. In order to allow the capability of providing monitoring for various reasons such as: special studies, modeling verification and compliance status, and other objectives; certain monitors are designated as Special Purpose Monitors (SPM). These monitors are not committed to any one location or for any specified time period. They may be located as separate monitoring stations or be included at SLAMS locations. Monitoring data may be reported to AQS, provided that the monitors and stations conform to all requirements of the SLAMS network. Specific regulations regarding SPM's are contained in 40 CFR 58 §58.20.

(C) NCORE: The NCORE multipollutant stations are a subset of SLAMS. NCORE stations measure multiple pollutants to provide support to integrated air quality management data needs. NCORE stations include both neighborhood and urban scale measurements in a select number of metropolitan areas and a limited number of rural locations.

NCORE stations must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10-2.5}$ particle mass, O_3, SO_2, CO, NO/NO_Y, wind speed, wind direction, relative humidity, and ambient temperature.

(D) Speciation Trends Network (STN): Speciation Trends Network stations are those stations designated to be part of the speciation trends network. These stations collect samples that are analyzed to determine the chemical makeup of $PM_{2.5}$. The STN is part of the chemical speciation network (CSN) which encompasses the original STN monitoring sites as well as supplemental speciation sites.

(E) Photochemical Assessment Monitoring Station (PAMS): These stations are dedicated to obtaining more information about ozone and its precursors. PAMS stations collect and monitor some or all of the following: speciated volatile organic compounds (VOCs), carbonyls, NO/NOy, O3, CO, and meteorological data.

6. Monitoring Methods

Sampling and analytical procedures for criteria air pollutant monitoring performed in the MCAQ ambient air monitoring network and used for NAAQS comparison are conducted in accordance with applicable USEPA Designated Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM) unless otherwise noted. Analytical techniques for non-criteria air pollutant monitoring (methods employed that are not USEPA Designated Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM)) are documented in the applicable MCAQ Quality Assurance Project Plan (QAPP) and/or the applicable MCAQ Standard Operating Procedure (SOP). Methods used by MCAQ for criteria pollutant monitoring and selected non-criteria monitoring are listed below:

(A) Particulate Matter 10 microns in size (PM_{10})

PM_{10} samplers operated by MCAQ are operated as federal equivalent method (FEM) samplers and are operated according to the requirements set forth in 40 CFR 50, 40 CFR 58, and 40 CFR 53. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Met One BAM 1020 (PM_{10})-STP	EQPM-0798-122	122
Met One BAM 1020 (PM_{10})-LC	EQPM-0798-122	122

(B) Particulate Matter 2.5 microns in size and coarse ($PM_{2.5}$, PM_C)

$PM_{2.5}$ and PM_c (coarse) samplers operated by MCAQ are either FRM or FEM samplers. Listed below are the applicable USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
R & P Partisol-Plus 2025 PM-2.5 Seq.	RFPS-0498-118	145
Met One BAM 1020 ($PM_{2.5}$)	EQPM-0308-170	170
Met One BAM 1022 ($PM_{2.5}$)	EQPM-1013-209	209
Met One BAM 1020 ($PM_{10\text{-}2.5}$)	EQPM-0709-185	185

(C) $PM_{2.5}$ Speciation Sampling and Analysis

In addition to operating $PM_{2.5}$ samplers that determine only $PM_{2.5}$ mass values, MCAQ operates $PM_{2.5}$ speciation samplers which collect samples that are analyzed to determine the chemical composition of the $PM_{2.5}$ fraction. Data collected using these methods cannot be compared to the NAAQS. Listed below is the method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Met One SuperSASS	NA	810
URG-3000N (Carbon Channel)	NA	Various

(D) Sulfur Dioxide (SO2)

Instruments used to continuously monitor sulfur dioxide levels in the atmosphere employ the pulsed UV fluorescence method. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Electron 43A, 43C-TLE, 43i, 43i-TLE	EQSA-0486-060	560

(E) Carbon Monoxide (CO)

Continuous monitoring for carbon monoxide is performed using the non-dispersive infrared (gas filter correlation) method. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Electron or Thermo Environmental Instruments 48, 48C, 48i, 48i-TLE	RFCA-0981-054	554

(F) Ozone (O_3)

Ozone is monitored using the UV photometry method. Listed below is the USEPA Designated Reference or Equivalent Method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Electron or Thermo Environmental Instruments 49, 49C, 49i	EQOA-0880-047	047

(G) Nitrogen Dioxide (NO_2)

The methods used to monitor the nitrogen dioxide level in ambient air are photolytic-chemiluminescence and Cavity Attenuated Phase Shift (CAPS). Listed below are the USEPA Designated Reference or Equivalent Methods used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Teledyne API, T200UP	EQNA-0512-200	200
Teledyne API, T200U	RFNA-1194-099	599
Teledyne API, N500	EQNA-0320-256	256

(H) Reactive Oxides of Nitrogen (NO_y)

The chemiluminescence method is used to monitor the reactive oxides of nitrogen levels in ambient air. Listed below is the instrumentation used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Thermo Environmental Instr. 42C-Y, 42i-Y	NA	674

(I) Speciated Volatile Organic Compounds (VOCs)

The auto-gas chromatograph (auto-GC) flame ionization detection (FID) method is used to monitor speciated volatile organic compounds in ambient air. Listed below is the instrumentation used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Agilent Technologies 7890B	NA	228

(J) Air Toxics

Air toxics sampling in Mecklenburg County is operated using equipment maintained by the North Carolina Division of Air Quality. Listed below is the method used in the MCAQ monitoring network:

Method	Designation Number	Method Code
Compendium Method for Toxic Organics	Compendium Method TO-15	150

(K) Lead (Pb)

Lead (Pb) monitoring is not currently being conducted and is not currently required per 40 CFR 58 Appendix D §4.5. The most recent Pb monitoring was conducted from January 1, 2012 through April 30, 2016. Pb monitoring at the Garinger High School NCORE monitoring station

(37-119-0041) was discontinued on April 30, 2016 in accordance with revisions to NCORE design criteria per 40 CFR 58, Appendix D(3). Concentrations of Pb measured at the station were well below the NAAQS (0.15 μg/m3). The maximum rolling three (3) month average for the period January 1, 2012 through April 30, 2016 was 0.003 μg/m3, approximately 2% of the NAAQS.

The Pb-PM_{10} low volume method was used for monitoring lead in the MCAQ monitoring network for the period from January 1, 2012 through April 30, 2016. Analysis for lead in PM_{10} collected on the filters was conducted in accordance with 40 CFR 50, Appendix Q. Listed below is the method used in the MCAQ monitoring network during the period:

Method	Designation Number	Method Code
R & P Partisol-Plus 2025 PM-10 Seq.	RFPS-1298-127	811

7. Quality Assurance Status

MCAQ operates according to EPA approved Quality Assurance Project Plans (QAPP) and Standard Operating Procedures (SOP). The MCAQ QAPP for criteria pollutants (including NCore NOy and near-road NO_2) was approved by US EPA on October 17, 2016. The MCAQ Quality Management Plan (QMP) was approved by US EPA on August 8, 2017.

MCAQ has an extensive quality assurance program to ensure that all air monitoring data collected meets established criteria for precision and bias. Staff members perform independent audits of instrumentation on a regularly scheduled basis to ensure that each instrument is calibrated and operating properly. Data validation is performed monthly to ensure data reported by each instrument is recorded accurately in the air quality monitoring database.

Air Toxics monitoring in Mecklenburg County is operated in conjunction with NCDAQ and according to NCDAQ Urban Air Toxics' (UAT) QAPP (Effective date: 7/2/2014) . NCDAQ submitted a revised UAT QAPP to US EPA on August 12, 2021.

8. Scale of Representativeness

Each station in the monitoring network must be described in terms of the physical dimensions of the air parcel nearest the monitoring station throughout which actual pollutant concentrations are reasonably similar. Area dimensions or scales of representativeness used in the network description are:

(a) Microscale - defines the concentration in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

(b) Middle scale - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

(c) Neighborhood scale – defines concentrations within an extended area of a city that has relatively uniform land use with dimensions ranging from about 0.5 to 4.0 kilometers.

(d) Urban scale - defines an overall citywide condition with dimensions on the order of 4 to 50 kilometers.

(e) Regional Scale - defines air quality levels over areas having dimensions of 50 to hundreds of kilometers.

Closely associated with the area around the monitoring station where pollutant concentrations are reasonably similar are the basic monitoring exposures of the station. There are six basic exposures:

(a) Stations located to determine the highest concentrations expected to occur in the area covered by the network.

(b) Stations located to determine representative concentrations in areas of high population density.

(c) Stations located to determine the impact on ambient pollution levels of significant sources or source categories.

(d) Stations located to determine general background concentration levels.

(e) Stations located to determine the extent of regional pollutant transport among populated areas; and in support of secondary standards.

(f) Stations located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts.

The design intent in siting stations is to correctly match the area dimensions represented by the sample of monitored air with the area dimensions most appropriate for the monitoring objective of the station. The following relationship of the six basic objectives and the scales of representativeness are appropriate when siting monitoring stations:

Site Type	Appropriate Siting Scales
1. Highest concentration.....	Micro, middle, neighborhood (sometimes urban or regional for secondarily formed pollutants).
2. Population oriented.....	Neighborhood, urban.
3. Source impact.....	Micro, middle, neighborhood.
4. General/background & regional transport.....	Urban, regional.
5. Welfare-related impacts...	Urban, regional.

Table 2.

9. Data Processing and Reporting

MCAQ ambient air quality monitoring data are stored in the Agilaire AirVision SQL database located at the Valerie Woodard Center, 3205 Freedom Drive, Charlotte, North Carolina. The database is maintained by the Mecklenburg County Information Technology Services department.

Monthly data validation processes are conducted by MCAQ air monitoring specialist and senior air monitoring specialists as data is collected. After monthly data validation procedures are successfully completed; data are transmitted to the US EPA's national Air Quality System (AQS) database. The AQS database is maintained by US EPA as the official repository of the fully quality assured ambient air quality dataset. Data submitted to the AQS database are certified by the air monitoring program manager by May 1st of each year in accordance with 40 CFR 58 §58.15.

III. NETWORK SUMMARY

1. Station Table - Criteria Pollutants, NCORE Parameters, and PAMS Monitored

EPA AQS ID Station Name	CO	NO_2	O_3	$PM_{2.5}$ FRM	$PM_{2.5}$ Cont[1] FEM	PM_{10} Cont[2]	SO_2	$PM_{10-2.5}$ Cont[3]	NO_y	Speciated VOCs
37-119-0041 Garinger (NCORE/PAMS)	**X**	**X Area-wide**	**X**	**X**[4]	**X**	**X**	**X**	**X**	**X**	**X**
37-119-0045 Remount	**X**	**X Near-road**		**X**[5]	**X**					
37-119-0046 University Meadows			**X**							
37-119-0047 PM_{10} Ramblewood Park						**X**				
37-119-0048 $PM_{2.5}$ Friendship Park					**X**					
37-119-0050 Equipment Dr[6]		**X Near-road**								

1) $PM_{2.5}$ Continuous (BAM 1020/1022).
2) PM_{10} Cont: PM_{10} Continuous.
3) $PM_{10-2.5}$ Cont: $PM_{10-2.5}$ Continuous.
4) NCORE Required 1 in 3 day filter-based sampling (FRM) and collocation for BAM 1020 primary.
5) Collocated 1 in 12 day filter-based FRM collocation for BAM 1022 primary.
6) Proposed 2nd-Near-Road NO_2 monitoring site

Table 3.

2. Site Map

AIR QUALITY MONITORING STATIONS
MECKLENBURG COUNTY, NC

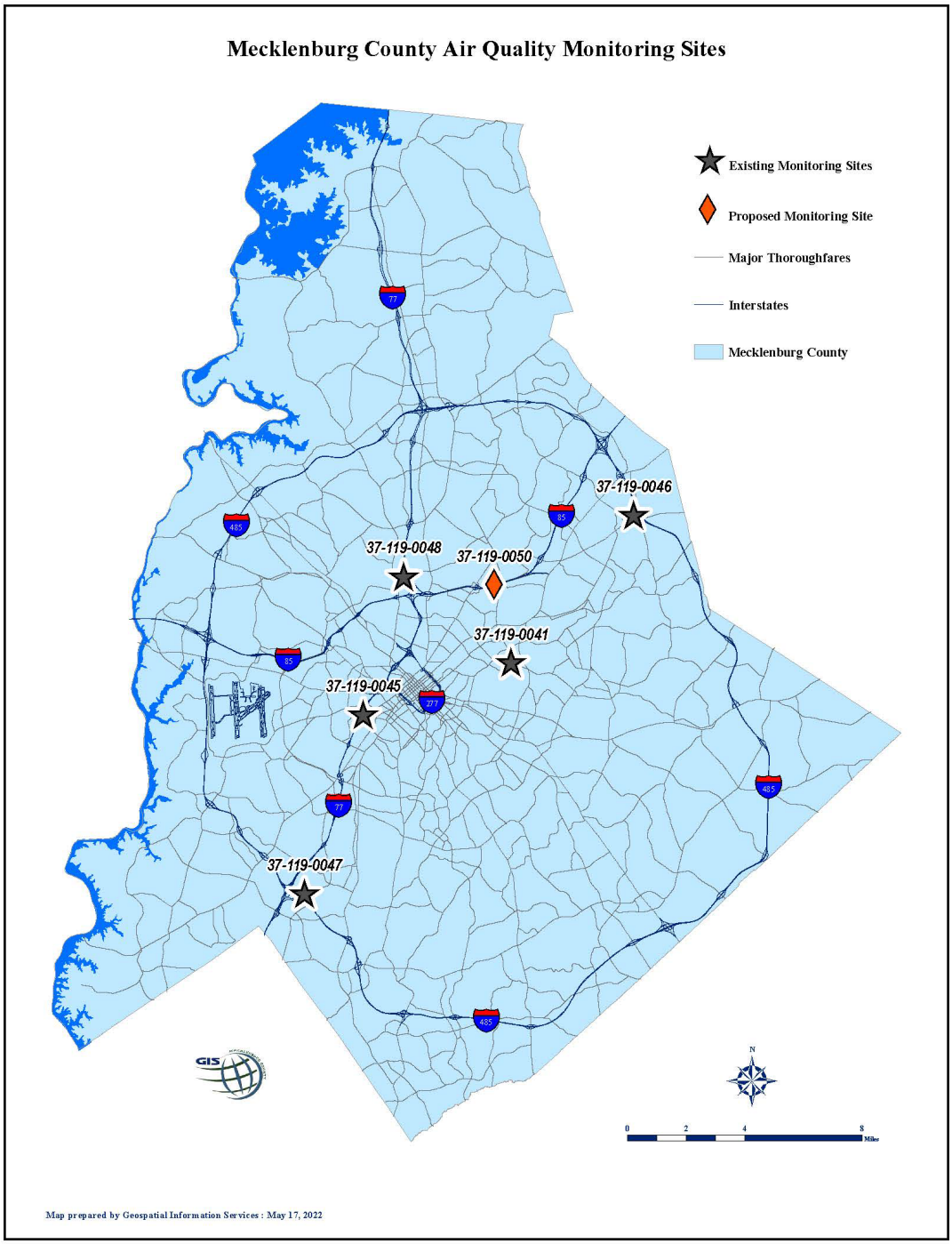

Figure 1.

3. Monitoring Methods

Site	Parameter	Instrument / Method	Meth. Code[1]	Param. Code[2]	POC	MT/MNC[3]
37-119-0041	SO2	Pulsed UV Fluorescent	560	42401	2	SLAMS NCORE
37-119-0041	CO	Gas Filter Correlation	554	42101	4	SLAMS NCORE
37-119-0041	NO- NO_2-NOx Area-wide	Chemi-luminescence	599	42601, 42602, 42603	1	SLAMS NCORE
37-119-0041	NO- NO_2-NOx Area-wide	CAPS	256	42601, 42602, 42603	1	SLAMS PAMS
37-119-0041	NO-Dif-NOy	Chemi-luminescence	674	42601, 42612, 42600	2	SLAMS NCORE PAMS
37-119-0041	PM10-2.5 Coarse	Met One BAM 1020 System (LC)	185	86101	4	SLAMS NCORE
37-119-0041	PM10	Met One BAM 1020 (LC)	122	85101	4	SLAMS
37-119-0041	PM10	Met One BAM 1020 (STP)	122	81102	4	SLAMS
37-119-0041	PM2.5	Met One BAM 1020	170	88101	3	SLAMS
37-119-0041	Ozone	UV Photometric	047	44201	1	SLAMS NCORE PAMS
37-119-0041	PM2.5	FRM	145	88101	1	SLAMS NCORE
37-119-0041	PM2.5	STN-Met One/URG	810	Multiple	5	CSN NCORE
37-119-0041	Speciated VOCs[4]	Auto-GC-FID	228	Multiple[4]	6	SLAMS PAMS
37-119-0041	Mixing Layer Height	Vaisala	011	61301	1	SLAMS PAMS
37-119-0041	Barometric Pressure	R. M. Young	011	64101	1	SLAMS PAMS
37-119-0041	Outdoor Temperature	R. M. Young	020	62101	1	SLAMS NCORE PAMS

Site	Parameter	Instrument / Method	Meth. Code[1]	Param. Code[2]	POC	MT/MNC[3]
37-119-0041	Precipitation	R. M. Young	011	65102	1	SLAMS PAMS
37-119-0041	Relative Humidity	Met One	012	62201	1	SLAMS NCORE PAMS
37-119-0041	Solar Radiation	Matrix	011	63301	1	SLAMS PAMS
37-119-0041	Wind Direction-Resultant	R. M. Young	068	61104	1	SLAMS NCORE PAMS
37-119-0041	Wind Speed-Resultant	R. M. Young	068	61103	1	SLAMS NCORE PAMS
37-119-0041	Wind Direction-Scalar	R. M. Young	068	61102	1	SLAMS
37-119-0041	Wind Speed-Scalar	R. M. Young	068	61101	1	SLAMS
37-119-0041	UV Radiation	Kipp & Zonen	011	63302	1	SLAMS PAMS
37-119-0045	NO- NO_2-NOx Near-road	FEM	200	42601, 42602, 42603	1	SLAMS
37-119-0045	NO- NO_2-NOx Near-road	CAPS	256	42601, 42602, 42603	1	SLAMS
37-119-0045	CO	Gas Filter Correlation	554	42101	1	SLAMS
37-119-0045	PM2.5	Met One BAM 1022	209	88101	3	SLAMS
37-119-0045	PM2.5	FRM	145	88101	1	SLAMS
37-119-0045	Relative Humidity	Met One	012	62201	1	SLAMS
37-119-0045	Outdoor Temperature	R. M. Young	020	62101	1	SLAMS
37-119-0045	Wind Direction-Resultant	R. M. Young	068	61104	1	SLAMS
37-119-0045	Wind Speed-Resultant	R. M. Young	068	61103	1	SLAMS
37-119-0045	Wind Direction-Scalar	R. M. Young	068	61102	1	SLAMS
37-119-0045	Wind Speed-Scalar	R. M. Young	068	61101	1	SLAMS

Site	Parameter	Instrument / Method	Meth. Code[1]	Param. Code[2]	POC	MT/MNC[3]
37-119-0046	Ozone	UV Photometric	047	44201	1	SLAMS
37-119-0047	PM10	Met One BAM 1020 (STP)	122	81102	4	SLAMS
37-119-0048	PM2.5	Met One BAM 1022	209	88101	3	SLAMS
37-119-0049	NO- NO_2-NOx Near-road	CAPS	256	42601, 42602, 42603	1	SLAMS

Table 4.

1- Meth. Num. = Method Code
2- Param. Num. = Parameter Code
3- MT = Monitor Type: SLAMS – State and Local Air Monitoring Station, SPM – Special Purpose, NON – Non-regulatory. MNC = Monitor Network Code: NCORE – National Core, CSN – Chemical Speciation Network, PAMS – Photochemical Assessment Monitoring Station
4 – See parameter codes for speciated VOCs in Appendix E

4. Network Modifications, Waiver Requests, and MOA's

(A) Monitoring Station Siting Modifications

1. Nitrogen Dioxide (NO_2) Monitoring – MCAQ currently operates two nitrogen dioxide monitoring stations. An area-wide NO_2 monitoring station is operated at the Garinger High School location (37-119-0041) and a near-road NO_2 station is operated at the Remount location (37-119-0045).

40 CFR 58 Appendix D, §4.3.2(a) requires implementation of an additional near-road NO_2 monitoring station in any CBSA with a population of 2,500,000 persons or more. The July 1, 2019 population estimate for the Charlotte-Concord-Gastonia, NC-SC CBSA was greater than 2.5 million people. The Charlotte-Gastonia-Concord, NC-SC CBSA population estimate for July 1, 2019 is 2,636,883.

In consultation with U.S. EPA Region 4, MCAQ conducted a search for suitable near-road sites in accordance siting criteria detailed in the Near-Road NO_2 Monitoring Technical Assistance Document ("TAD"). Discussions with U.S. EPA monitoring staff resulted in the determination of the optimal location for the establishment of an additional near-road NO_2 station on Equipment Drive in Charlotte, NC. This proposed site is located adjacent to I-85, between exits 40 and 41. This location was identified as the top priority from a list of proposed locations based on safety, ease of access, and limited site prep, in addition to the site meeting near-road NO_2 siting requirements.

MCAQ prepared a Notification of Change – *Addendum to the 2021-2022 Annual Network Plan for Mecklenburg County Air Quality ("MCAQ-Plan")* site to incorporate details about the additional near-road NO_2 monitoring station at Equipment Drive, as required by 40 CFR 58 Appendix D, §4.3.2(a) and referenced in Section 4(a) "Monitoring Station Siting Modifications" of the annual network plan. The addendum was posted for public notice and comment on the MCAQ web site for a period of 30 days beginning on March 22, 2022 and ending on April 21, 2022. No comments were received. MCAQ has also requested final U.S. EPA approval to establish the Equipment Drive station (proposed new AQS ID: 37-119-0050) in accordance with the "Notification of Change – Addendum to the MCAQ – Plan".

An as-built for the proposed site has been obtained from the NC Department of Transportation (NCDOT), and MCAQ has identified resources to help facilitate project management and permitting for the proposed site. MCAQ has secured Armstrong Glenn to provide engineering and design services for the site. Additionally, MCAQ has begun working with vendors to order monitoring equipment for the site.

MCAQ will continue preparing to install and operate the additional near-road NO_2 station in the MCAQ monitoring network as funding and personnel resources allow, with the goal of implementation on or before January 1, 2023. This date was extended to account for

- Limited/slow response to site development requests for proposals.
- Planning delays due to COVID-19.
- Necessary network plan addendum revisions and public comment opportunity.

(B) Instrument Operation Modification

Except for the Photochemical Assessment Monitoring and 2nd Near-Road NO_2 implementation (see sections 4(A) and (E)), no startups, shutdowns, or other major "Instrumentation Operation Modifications" are planned at the currently operating monitoring stations in the MCAQ monitoring network for 2022-2023.

(C) Waivers

MCAQ is not requesting waivers in the 2022-2023 Monitoring Plan.

(D) Memorandum of Agreement

A Memorandum of Agreement (MOA) dated July 1, 2016 was established forming the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement among North Carolina Division of Air Quality (NCDAQ), South Carolina Division of Health and Environmental Control (SCDHEC), and Mecklenburg County Air Quality (MCAQ). The MOA was established to collectively meet the US EPA minimum monitoring requirements for criteria pollutant monitoring deemed necessary to meet the needs of the MSA as determined by all parties.

MCAQ is submitting the MOA as an attachment to the monitoring plan to provide notification to US EPA of the purpose, agency roles and responsibilities, and limitations of the MOA. A copy of the agreement is attached as Appendix B to this plan.

(E) Plan for Making Photochemical Assessment Monitoring Station (PAMS) Measurements

MCAQ is participating in the PAMS implementation process that is being directed by USEPA and associated USEPA vendors (currently USEPA and Battelle, collectively - EPA). On December 20, 2019, EPA finalized a revision to the start date for PAMS. The revision provides state and local agencies an additional two years from the original implementation date of June 1, 2019, to implement the PAMS program requirements.

MCAQ began measuring the following parameters on June 1, 2021, and will be measuring these parameters during the 2022 PAMS season (June 1st – August 31st):

- Auto-GC speciated VOCs
- Ozone
- NO/NOy
- Mixing Layer Height
- Ambient Temperature
- Relative Humidity
- Barometric Pressure
- Wind Speed
- Wind Direction
- Solar Radiation
- Precipitation

Due to vendor delays, supply chain interruptions, and staffing shortages, MCAQ's implementation of the following parameters has been delayed:

- True NO_2
- UV radiation

MCAQ intends to begin measuring True NO_2 and UV radiation by mid-summer 2022.

MCAQ does not intend to be measuring the following parameters during the 2022 PAMS season unless additional funding becomes available: TO-11A (carbonyls)

(D) Special Purpose (Non-Regulatory) Monitoring Related to the Colonial Pipeline Spill

In April 2021, MCAQ and NCDAQ installed an air toxics sampler on-site to evaluate specific volatile air pollutants during clean-up efforts related to the Colonial Pipeline Spill in Huntersville, NC. This special purpose monitor (SPM) was established as the Oehler Air Monitoring Station (AQS ID: 37-119-0049) to screen for specific air toxics and help inform decisions about the need for long-term monitoring.

Oehler SPM Site Map

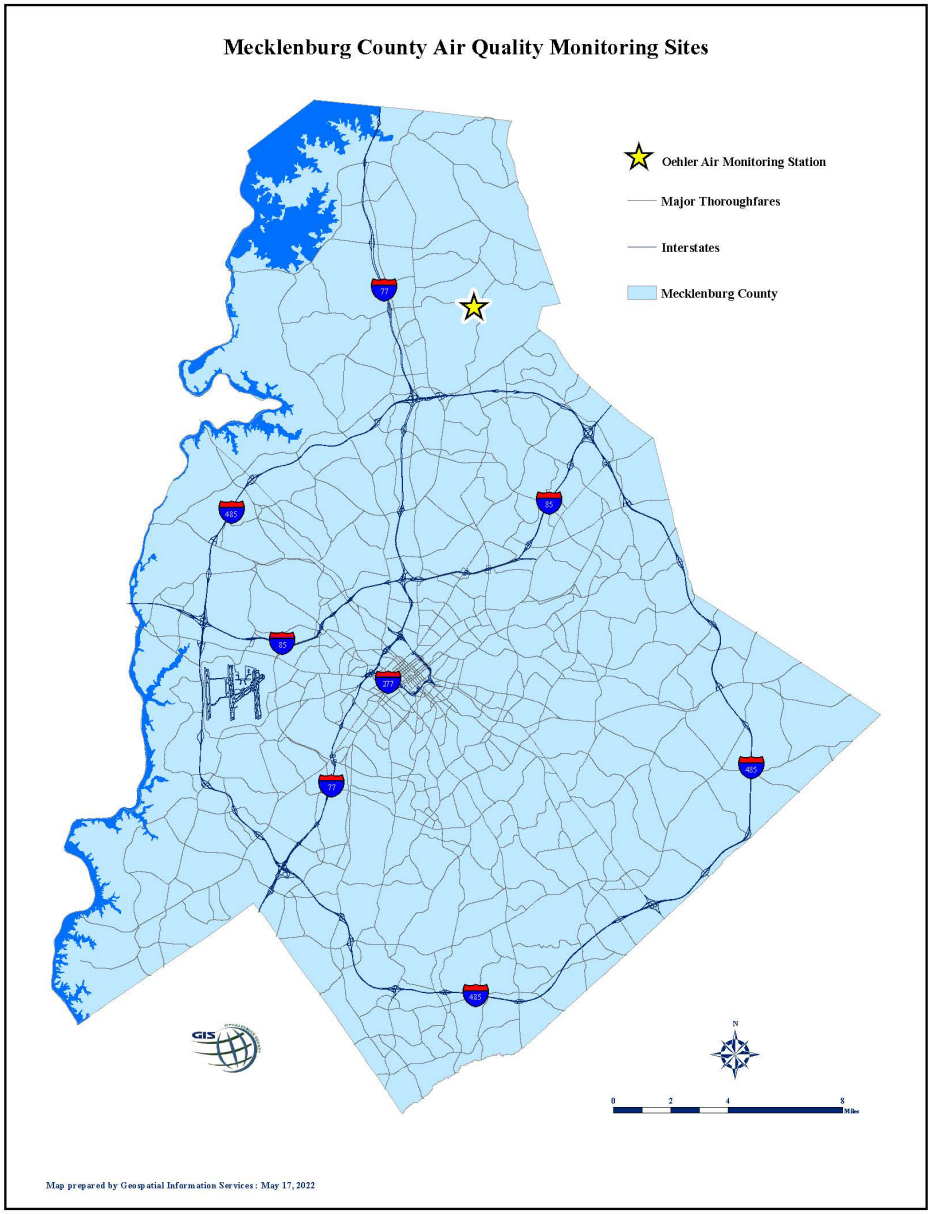

Figure 2.

Oehler SPM Description

AQS Site ID:	37-119-0049		
Site Name:	Oehler		
Street Address:	14108 Huntersville-Concord Rd.		
City:	Huntersville		
Latitude:	N35.413342˚		
Longitude:	W80.805735˚		
MSA:	Charlotte-Gastonia-Concord, NC-SC (#16740)		
Monitor Type:	Special Purpose (Non-regulatory)		
Operating Schedule:	24-hour, midnight to midnight, 1-in-6 day		
Monitoring Objective:	Public information/Source-oriented		
Statement of Purpose:	Screen for volatile air pollutants at pipeline spill site,		
Scale:	Microscale		
Suitable for NAAQS Comparison:	Not applicable		
SPM Meets Requirements of Part 58, Appendices A, D, and E:	No		
Date Established:	April 4, 2021	Date Terminated:	Not applicable
Proposal to move or change:	N/A		

Table 5.

A Xonteck 911 sampler collects 24-hour composite air sample every 6 days in stainless steel 6-liter pressurized canisters supplied by NCDAQ. NCDAQ maintains the sampler. MCAQ operates the sampler, retrieves sample cannisters, and returns the sample cannisters to NCDAQ's lab. Samples are analyzed by the NCDAQ lab for the suite air toxics compounds using the Compendium Method for Toxic Organics 15 (TO-15). The list of compounds can be found in Table 7 of this document.

The Oehler SPM is not suitable for NAAQS comparison, as there are not any NAAQS for the suite of air toxics compounds screened for at the Oehler SPM. However, there are exposure guidelines for many of the compounds established by the Centers for Disease Control and Prevention's (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) and National Institute of Occupational Safety and Health (NIOSH) to which the monitoring data can be compared. To date, data collected and analyzed by the NCDAQ have shown concentrations below the CDC and NIOSH guidelines. Additional information about the Oehler SPM air monitoring can be found at https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/colonial-pipeline-spill-information-huntersville-nc#air-monitoring.

IV. AIR MONITORING STATION DESCRIPTIONS

1. Garinger

(A) Garinger Station Table

Station Name: Garinger				
AQS Station Identification Number: 37-119-0041				
Location: 1130 Eastway Drive				
Charlotte, NC 28205				
Latitude: N35.240100º		Datum: WGS84		
Longitude: W80.785683º				
Elevation: 232 meters				
Parameter	Method	Method Code	Probe Height (m)	Sampling Schedule
Ozone	UV Photometry	47	4.3	Continuous
$PM_{2.5}$	FRM Gravimetric	145	5.0	1 in 3 day
$PM_{2.5}$	Met One, Speciation	810	4.8	1 in 3 day
$PM_{2.5}$	URG-3000n, Carbon Speciation	Various	5.0	1 in 3 day
$PM_{2.5}$	BAM 1020	170	5.2	Continuous
PM_{10} (STP)	BAM 1020	122	5.1	Continuous
PM_{10} (LC)	BAM 1020	122	5.1	Continuous
$PM_{10-2.5}$	BAM 1020 Coarse	185	5.1	Continuous
NO_2	Chemiluminescence	599	4.2	Continuous
NO_2	CAPS	256	4.2	Continuous
CO	NDIR, GFC	554	4.2	Continuous
SO_2 Pre-cursor Gas	UV Pulsed Fluorescence	560	4.2	Continuous
NOy Pre-cursor Gas	Chemiluminescence	674	7.0	Continuous
Speciated VOCs	Auto-GC-FID	228	4.2	Continuous from June 1-August 31
Wind Speed	R. M. Young	68	10	Continuous
Wind Direction	R. M. Young	68	10	Continuous
Pressure	R. M. Young	11	2	Continuous
Outdoor Temperature	R. M. Young	20	4.9	Continuous

Solar Radiation	Matrix	11	3.9	Continuous
UV Radiation	Kipp & Zonen	11	3.9	Continuous
Precipitation	R. M. Young	11	4.2	Continuous
Relative Humidity	Met One	12	4.9	Continuous
Mixing Layer Height	Vaisala	11	NA	Continuous

Parameter	Date Established	Date Terminated
Ozone	March 3, 2000	NA
$PM_{2.5}$ FRM	July 29, 1999	NA
$PM_{2.5}$ Speciation (Met One)	January 13, 2001	NA
$PM_{2.5}$ Speciation (URG)	April 1, 2009	NA
$PM_{2.5}$ BAM 1020	March 6, 2017	NA
PM_{10} BAM 1020	March 6, 2017	NA
$PM_{10-2.5}$ BAM Coarse	March 6, 2017	NA
NO_2	November 12, 1999	NA
CO	November 11, 1999	NA
SO_2 Precursor Gas	January 1, 2006	NA
CO Precursor Gas	January 1, 2006	NA
NOy Precursor Gas	May 4, 2007	NA
Speciated VOCs	June 1, 2021	NA
Meteorological Parameters	January 1, 2003 (latest)	NA

Nearest Road:	Shamrock Drive	Distance to Road:	298 meters
AADT:[1,2]	9,700	Year of Count:	2020
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2012)	MSA #:	16740

2020 Population (15 census block groups within 1 mile of property)	Projected 2022 Population (15 census block groups within 1 mile of property)
33,119	35,071

[1]Annual Average Daily Traffic (AADT) Data obtained from: NCDOT Annual Average Daily Traffic (AADT) Mapping Application (arcgis.com).
[2] NCDOT 2020 COVID19 Traffic Monitoring Impact Memo _

Table 6.

(B) Garinger Station Description and Statement of Purpose

The Garinger High School station is an NCORE multi-pollutant station. The monitoring station is located at 1130 Eastway Drive. The station is located in a grassy area in the southwest corner of the Garinger High School property, near the left field line of the baseball field.

The station is located 5.3 kilometers ENE of the Charlotte, NC central business district. There is unrestricted airflow in at least a 270º arc of exposure, including the predominant southwest wind direction. Sample inlets are >20 meters from the nearest trees. The station is generally oriented along the primary summer wind vector (SW to NE), downwind of the central business district of Charlotte, NC.

The station is an NCORE multi-pollutant monitoring station. NCORE parameters monitored include trace-level CO, trace-level SO_2, trace-level NO and NOy, ozone (O_3), $PM_{2.5}$, $PM_{10-2.5}$, and meteorological parameters. The $PM_{2.5}$, NO_2 and SO_2 monitors are used for NAAQS determination. The NO_2 monitor is designated as the area wide NO_2 monitor for the CBSA.

PAMS is also being implemented at the station. PAMS parameters monitored at the station include Speciated VOCs, O_3, NO, NOy, Ambient Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction, Solar Radiation, Mixing Layer Height, and Precipitation. As of August 1, 2022, MCAQ intends to also be monitoring the following PAMS parameters at the station: UV radiation, True NO_2,

A 1 in 3-day $PM_{2.5}$ sequential monitor, a $PM_{2.5}$ Met One SuperSASS Speciation monitor, and a URG-3000n carbon sampler are located on the roof of the monitoring shelter. The $PM_{2.5}$ speciation monitors are part of the speciation trends network (STN). Data from these monitors (STN – Met One Super SASS and URG-3000n) are not used for compliance determination.

$PM_{2.5}$ data from the Met One BAM PM Coarse System is reported as parameter 88101 and is designated as a SLAMS for AQI determination and forecasting purposes. PM_{10} (STP), PM_{10} (LC), and $PM_{10-2.5}$ reported from the BAM 1020 coarse system are also designated as SLAMS.

The continuous PM_{10} sampler operates as one of two required PM_{10} monitoring stations in the MSA.

The Garinger station is an NCORE station and as such must meet additional probe siting criteria. The meteorological tower at this station does not comply with the 10x rule for spacing from obstructions for meteorological measurements. Due to terrain features in the Mecklenburg County region it is difficult to locate a site that meets the requirements of the EPA Volume 4 QA/QC guidance for wind speed and wind direction measurements. Large trees are a dominant landscape feature in the area. The closest terrain feature is 2.6x and is to the southeast of the WS/WD instrument. The next closest obstructions (trees) are to the west of the sensor at 3.4x. MCAQ's 2009 NCORE Plan was approved as acceptable for WS/WD and included documentation noting the deviation from 10x siting criteria. Therefore, WS/WD monitoring is conducted at the current location as documented in the 2009 NCORE Plan as approved by USEPA Region 4 and USEPA Office of Air Quality Planning and Standards (OAQPS).

NCORE probe siting guidance for NOy is a probe height of 10 meters. The NOy probe inlet is currently mounted at a height of 7.0 meters.

The station complies with the siting requirements of 40 CFR 58 for criteria air pollutants. There are no proposed changes for the siting of this station. It is recommended that the current station status be maintained.

Additional Monitoring at Garinger High School

Monitoring for air toxics is conducted at the Garinger High School station. The North Carolina Division of Air Quality (NCDAQ) maintains a Xontek 911 sampling device at the Garinger High School station. MCAQ operates the sampler on a 1in 6-day sampling schedule as specified by NCDAQ. The sampler operates on standard time.

Whole air samples are collected in stainless steel 6 liter- pressurized canisters supplied by NCDAQ. Analysis of samples is conducted by NCDAQ. Samples are analyzed by NCDAQ using cryogenic pre-concentration gas chromatography with mass spectrometric detection (GC/MS) via the Compendium Method for Toxic Organics 15 (TO-15). The list of compounds is shown in Table 7.

Parameter	Parameter Code	Parameter	Parameter Code
Carbon Disulfide	42153	Bromodichloromethane	43828
Propene	43205	1,2 Dichloropropane (propylene dichloride)	43829
Freon 114	43208	trans-1,3 Dichloropropene	43830
Isobutene	43218	cis-1,3 Dichloropropene	43831
1,3-Butadiene	43220	1,2-Dichloroethene (ethylene dichloride)	43838
Pentane	43231	Ethylene dibromide	43843
Hexane	43242	Vinyl chloride	43860
Cyclopentane	43243	m- & p-Xylene	45109
Isoprene	43248	Benzene	45201
Cyclohexane	43270	Toluene	45202
Freon 22	43359	1,2-Dichloroethane	43815
MTBE	43372	Tetrachloro ethylene (perchloroethylene)	43817
Vinyl Acetate	43447	1,1,2,2-Tetrachloroethane	43818
Acrolein	43505	Bromomethane	43819
Methacrolein	43515	1,1,2-Trichloroethane (vinyl trichloride)	43820
Methyl Ethyl Ketone	43552	Freon 113	43821
3-Pentanone	43553	Ethylbenzene	45203
Ethylpropylketone (3-hexanone)	43557	o-Xylene	45204
Methyl Vinyl Ketone	43558	Bromodichloromethane	43828
Methyl Butyl Ketone	43559	1,2 Dichloropropane (propylene dichloride)	43829
Methyl Isobutyl Ketone	43560	trans-1,3 Dichloropropene	43830
2-Pentanone	43562	cis-1,3 Dichloropropene	43831
Acetonitrile	43702	1,2-Dichloroethene (ethylene dichloride)	43838
Methyl chloride (32hloromethane)	43801	Ethylene dibromide	43843
Methylene chloride	43802	Vinyl chloride	43860
Chloroform	43803	m- & p-Xylene	45109
Carbon tetrachloride	43804	Benzene	45201
Bromoform	43806	1,3,5-Trimethyl-benzene (mesitylene)	45207
Methyl Iodide	43808	1,2,4-Trimethyl-benzene (pseudocumene)	45208
Freon 11	43811	Styrene	45220
Chloroethane	43812	1,2,3-Trimethyl Benzene	45225
1,1-Dichloroethane (Ethylidene Chloride)	43813	Chlorobenzene (phenylchloride)	45801
1,1,1-Trichloroethane (Methyl chloroform)	43814	o-Dichlorobenzene	45805
1,2-Dichloroethane	43815	m-Dichlorobenzene	45806
Tetrachloro ethylene (perchloroethylene)	43817	p-Dichlorobenzene	45807
1,1,2,2-Tetrachloroethane	43818	Benzyl chloride	45809
Bromomethane	43819	1,2,4-Trichlorobenzene	45810
1,1,2-Trichloroethane (vinyl trichloride)	43820	1,4-Dioxane	46201
Freon 113	43821		
Freon 12	43823		
Trichloroethylene	43824		
1,1-Dichloroethene (Vinylidene chloride)	43826		

Table 7.

OBJECTIVE AND SPATIAL SCALE
The monitoring objective of the Garinger O_3, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ (FRM) monitors is to determine representative concentrations in areas of high population density (population exposure). Maximum concentrations for ozone and $PM_{2.5}$ may be measured under stagnant meteorological conditions. The station is a neighborhood scale site for all parameters. Data from this station is used to assess compliance with the NAAQS for O_3, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$.

The station is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC, NC; Cabarrus County, NC; Gaston County, NC; Iredell County, NC; Lincoln County, NC; Mecklenburg County, NC; Rowan County, NC; Union County, NC; Chester County, SC; Anson County; Lancaster County, SC; and York County, SC.

STATUS AND RECOMMENDATION
The Garinger NCORE station meets the required monitoring objectives and siting criteria of 40 CFR 58 Appendices A, B, C, D, and E, where applicable for criteria pollutants.

A photochemical assessment station (PAMS) will be implemented at the Garinger NCORE station in accordance with 40 CFR 58 Appendix D, §5(a) and section III.(4). MCAQ will continue preparing to implement the program as funding, supply chain, and personnel resources allow with the goal of full implementation on or before August 1, 2022 for a select set of PAMS parameters.

It is recommended that the current site status be maintained.

(C) Garinger Aerial Photograph

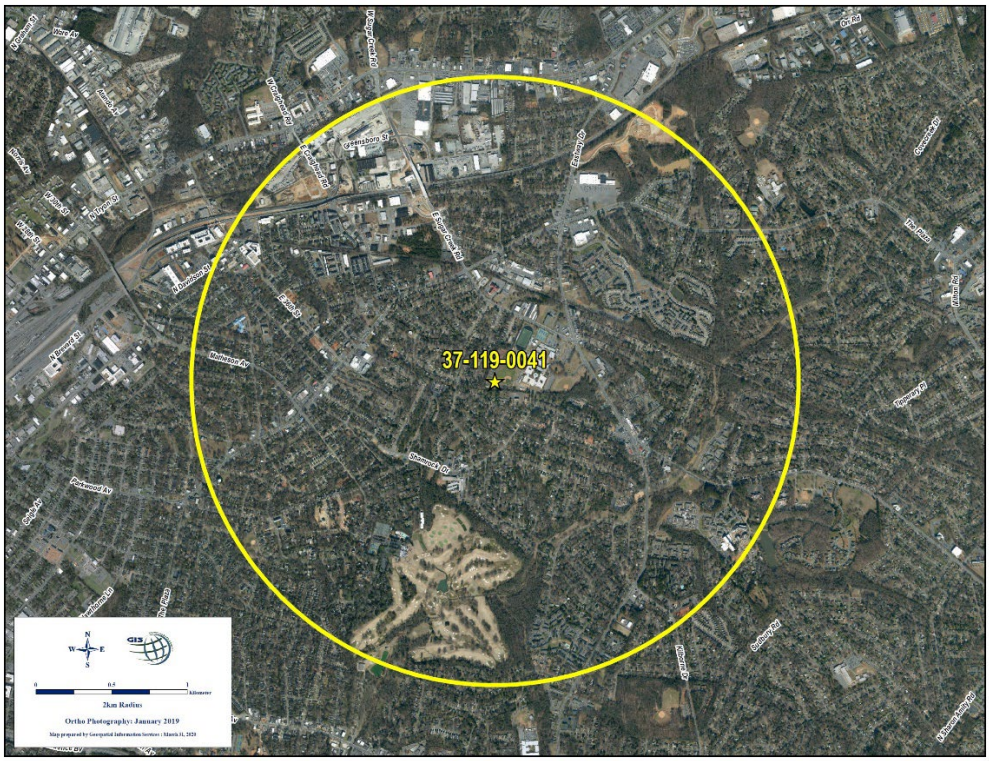

Figure 3. Garinger aerial photograph with 4 km diameter circle.

(D) Garinger Station Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

2. Remount

(A) Remount Station Table

Station Name:	Remount			
AQS Station Identification Number:	37-119-0045			
Location:	1030 Remount Road Charlotte, NC 28208			
Latitude:	N35.213171º	Datum:	WGS84	
Longitude:	W80.874084º			
Elevation:	194 meters			

Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
NO_2	FEM	200	4.5	Continuous
NO_2	CAPS	256	4.5	Continuous
CO	NDIR, GFC	554	4.4	Continuous
$PM_{2.5}$	FRM – Gravimetric	145	2	1 in 12 day
$PM_{2.5}$	BAM 1022	209	2	Continuous
Wind Speed	R. M. Young	68	10	Continuous
Wind Direction	R. M. Young	68	10	Continuous
Outdoor Temperature	R. M. Young	20	4.6	Continuous
Relative Humidity	Met One	12	4.6	Continuous

Parameter	Date Established	Date Terminated
NO_2	July 17, 2014	NA
CO	January 1, 2017	NA
$PM_{2.5}$ FRM 1/3	January 1, 2017	March 30, 2018
$PM_{2.5}$ FRM Collocated 1/12	April 1, 2018	NA
$PM_{2.5}$ BAM 1022	January 20, 2017	NA

Nearest Road:	I-77 South	Distance to Road:	35 meters
AADT:[1,2]	119,000	Year of Count:	2020
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2013)	MSA #:	16740

2020 Population (18 census block groups within 1 mile of property)	Projected 2022 Population (18 census block groups within 1 mile of property)
23,830	27,376

[1]Annual Average Daily Traffic (AADT) Data obtained from: NCDOT Annual Average Daily Traffic (AADT) Mapping Application (arcgis.com).
[2] NCDOT 2020 COVID19 Traffic Monitoring Impact Memo _

Table 8.

(B) Remount Station Description and Statement of Purpose

The Remount monitoring station is located in a field adjacent to Interstate 77 South (I-77S) between NC Highway 160 and mile marker 8. The station is located 3.2 kilometers SW of the central business district of Charlotte, NC.

A federal equivalent method (FEM) NO_2 analyzer is located at the Remount monitoring station. The NO_2 analyzer monitor type is SLAMS. The NO_2 monitor is located 35 meters from the edge of the roadway and is designated as a near-road monitoring station for the CBSA.

A federal reference method (FRM) CO analyzer is located at the Remount station and is a SLAMS monitor type.

A federal reference method (FRM) $PM_{2.5}$ and a continuous $PM_{2.5}$ BAM 1022 are located at the Remount monitoring station. The FRM $PM_{2.5}$ monitor was designated as a collocated monitor for the $PM_{2.5}$ BAM 1022 (method 209) on 4/1/2018. FRM sampling was reduced from a frequency of 1in 3 to 1 in 12 on 4/1/2018. The FRM $PM_{2.5}$ and $PM_{2.5}$ BAM 1022 monitors are SLAMS.

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the Remount NO_2 station is to determine the highest concentrations expected to occur in the area covered by the network. The NO_2 station is classified as a microscale station. The Remount station is representative of nitrogen dioxide concentrations in the near-road environment. Data is used to assess compliance with the nitrogen dioxide NAAQS. The NO_2, CO, FRM-$PM_{2.5,}$ and $PM_{2.5}$ BAM 1022 monitors are designated as SLAMS.

The station is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC, NC; Cabarrus County, NC; Gaston County, NC; Iredell County, NC; Lincoln County, NC; Mecklenburg County, NC; Rowan County, NC; Union County, NC; Chester County, SC; Anson County: Lancaster County, SC; and York County, SC.

STATUS AND RECOMMENDATIONS

The station meets the required monitoring objectives and siting criteria of 40 CFR 58 Appendices A, B, C, D, and E; where applicable, for criteria air pollutants. It is recommended that the current station status be maintained.

(C) Remount Aerial Photograph

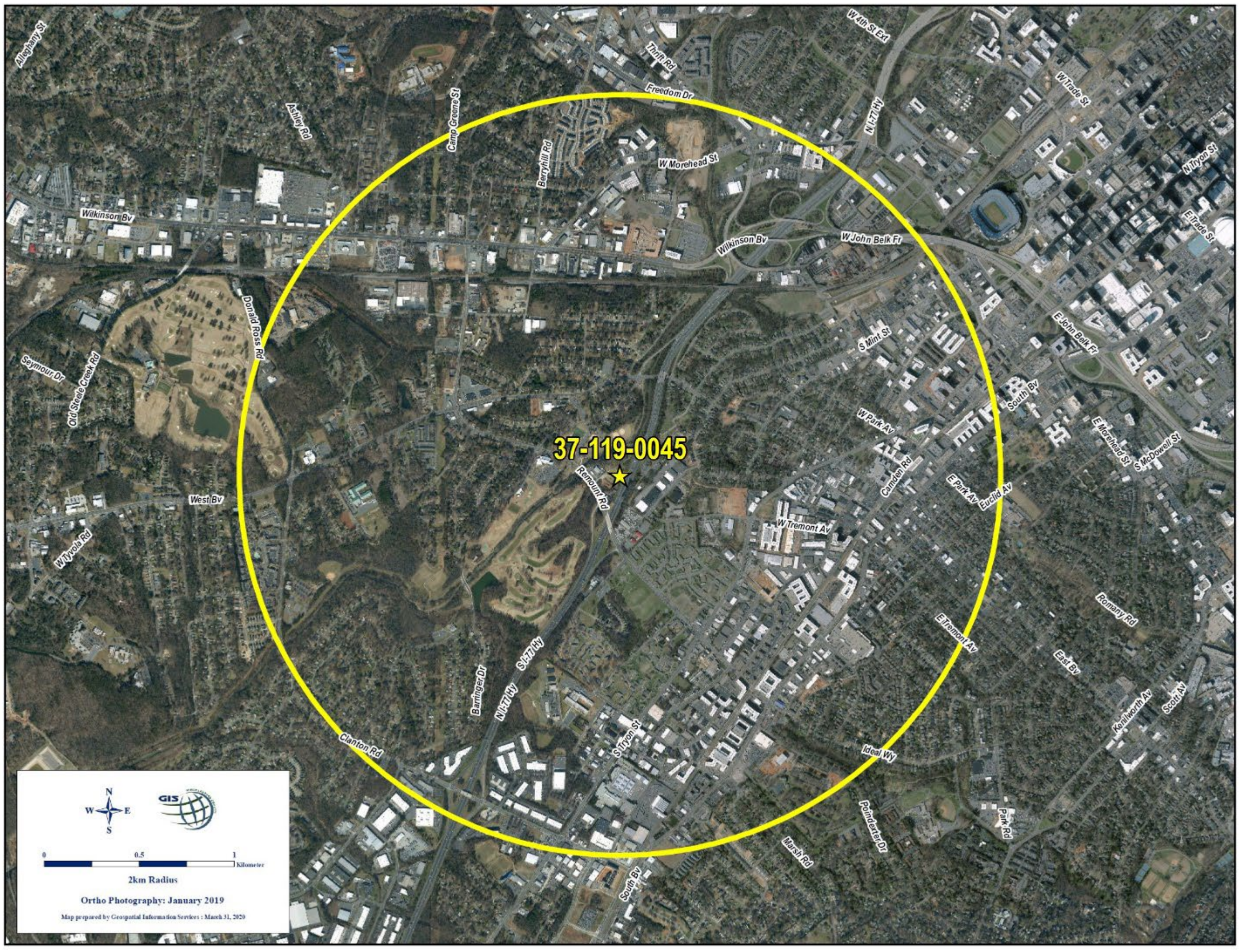

Figure 4. Remount aerial photograph with 4 km diameter circle.

(D) Remount Station Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

3. University Meadows

(A) University Meadows Station Table

Station Name:	University Meadows			
AQS Station Identification Number:	37-119-0046			
Location:	1660 Pavilion Boulevard Charlotte, NC 28262			
Latitude:	N 35.314158°	Datum:	WGS84	
Longitude:	W 80.713469°			
Elevation:	216 meters			

Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
Ozone	UV Photometry	47	4.2	March 1 – Oct. 31, Continuous

Parameter	Date Established	Date Terminated
Ozone	April 1, 2016	NA

Nearest Road:	Pavilion Blvd.	Distance to Road:	47 meters
AADT:[1]	9200	Year of Count:	2016
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2013)	MSA #:	16740

2020 Population (11 census block groups within 1 mile of property)	Projected 2022 Population (11 census block groups within 1 mile of property)
28,324	32,544

[11]Annual Average Daily Traffic (AADT) Data obtained from: NCDOT Annual Average Daily Traffic (AADT) Mapping Application (arcgis.com).

Table 9.

(B) University Meadows Station Description and Statement of Purpose

The University Meadows station is located 15 kilometers northeast of the central business district of the city of Charlotte, NC. The station is located approximately 340 meters north of the intersection of Highway 49 and Pavilion Boulevard in Mecklenburg County. The monitoring shelter is in a large grass field at University Meadows Park. There are no obstructions to air flow near the probe.

The ozone instrument is operated during the North Carolina ozone monitoring season which begins March 1st and ends October 31st. The ozone instrument operates continuously during the

seasonal period. The ozone monitor is a SLAMS monitoring station. Data is used to assess compliance with the NAAQS.

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the University Meadows ozone station is to determine the highest concentrations expected to occur in the area covered by the network. The station is an urban scale station which represents ozone levels over several kilometers. Data from this station is used to assess compliance with the NAAQS for ozone. The station is located along the primary summer wind vector in the Charlotte area which is predominated by winds from the southwest (prevailing wind direction). The station should measure peak ozone concentrations in Mecklenburg County.

The station is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC, NC; Cabarrus County, NC; Gaston County, NC; Iredell County, NC; Lincoln County, NC; Mecklenburg County, NC; Rowan County, NC; Union County, NC; Chester County, SC; Anson County; Lancaster County, SC; and York County, SC.

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STATUS AND RECOMMENDATIONS

The station meets the required monitoring objectives and siting criteria of 40 CFR 58 Appendices A, B, C, D, and E; where applicable, for criteria air pollutants. It is recommended that the current station status be maintained.

(C) University Meadows Aerial Photograph

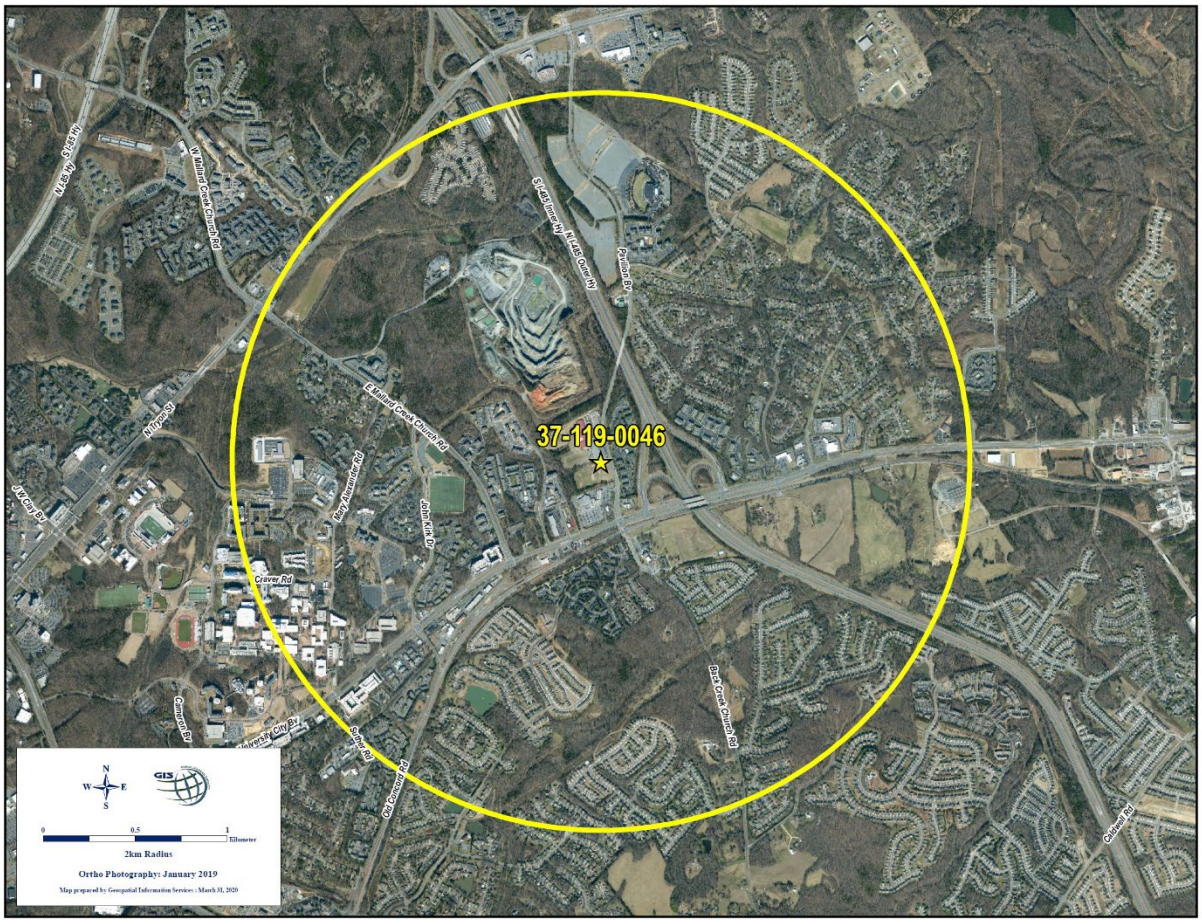

Figure 5. University Meadows aerial photograph with 4 km diameter circle.

(D) University Meadows Station Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

4. Ramblewood Park

(A) Ramblewood Park Station Table

Station Name:	Ramblewood Park			
AQS Station Identification Number:	37-119-0047			
Location:	10200 Nations Ford Road			
	Charlotte, NC 28273			
Latitude:	N 35.123954°	Datum:	WGS84	
Longitude:	W 80.907577°			
Elevation:	179 meters			
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
PM_{10} (STP)	BAM 1020	122	2	Continuous
Date Monitor Established:	PM_{10}	December 16, 2019		
Nearest Road:	I-485	Distance to Road:	238 meters	
AADT:[1]	122,000	Year of Count:	2020[2]	
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2013)		MSA #:	16740
2020 Population (6 census block groups within 1 mile of property)		Projected 2022 Population (6 census block groups within 1 mile of property)		
11,491		12,283		

[1]Annual Average Daily Traffic (AADT) Data obtained from: NCDOT Annual Average Daily Traffic (AADT) Mapping Application (arcgis.com).
[2] NCDOT 2020 COVID19 Traffic Monitoring Impact Memo _

Table 10.

(B) Ramblewood Park Station Description and Statement of Purpose

The Ramblewood Park station is 238 meters north of I-485 and 920 meters east of the center of the intersection of I-77 and I-485 in southern Mecklenburg County. The station is located 12.9 kilometers (8.0 miles) SSW of the central business district of Charlotte, North Carolina. The monitor is located in a large grass field between soccer field #9 and the baseball field at Ramblewood Park. There are no obstructions to air flow near the probe.

The station complies with the siting requirements of 40 CFR §58 Appendices A, C, D, and E for criteria air pollutants (PM_{10}).

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the Ramblewood Park station is to measure PM_{10} concentrations in an area of high population density. The station is a neighborhood scale station which represents

PM_{10} levels over several kilometers. Data from this station is used to assess compliance with the NAAQS for PM_{10}.

The station is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC, NC; Cabarrus County, NC; Gaston County, NC; Iredell County, NC; Lincoln County, NC; Mecklenburg County, NC; Rowan County, NC; Union County, NC; Chester County, SC; Anson County; Lancaster County, SC; and York County, SC.

STATUS AND RECOMMENDATIONS

The station meets the required monitoring objectives and siting criteria of 40 CFR 58 Appendices A, B, C, D, and E; where applicable, for criteria air pollutants. It is recommended that the current station status be maintained.

(C) Ramblewood Park Aerial Photograph:

Figure 6. Ramblewood Park aerial photograph with 4 km diameter circle

(D) Ramblewood Park Station Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

5. Friendship Park

(A) Friendship Park Station Table

Station Name:	Friendship Park			
AQS Station Identification Number:	37-119-0048			
Location:	2310 Cindy Lane			
	Charlotte, NC 28216			
Latitude:	N 35.281791°	Datum:	WGS84	
Longitude:	W 80.851473°			
Elevation:	224 meters			
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
PM2.5	BAM 1022	209	2	Continuous
Date Monitor Established:	$PM_{2.5}$	January 6, 2020		
Nearest Road:	Cindy Lane[1]	Distance to Road:	200 meters	
2nd Closest Rd:	I-77 South[2]	Distance to Road:	297 meters	
AADT:[1]	7,500[2], 86,500[3]	Year of Count:	2020[2,a], 2020[3,a]	
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2013)		MSA #:	16740
2020 Population (8 census block groups within 1 mile of property)		Projected 2022 Population (8 census block groups within 1 mile of property)		
18,693		19,787		

[1]Annual Average Daily Traffic (AADT) Data obtained from: NCDOT Annual Average Daily Traffic (AADT) Mapping Application (arcgis.com).
[2]Traffic information for Cindy Lane
[3]Traffic information for I-77 South
[a] NCDOT 2020 COVID19 Traffic Monitoring Impact Memo _

Table 11.

(B) Friendship Park Station Description and Statement of Purpose

The Friendship Park station is 200 meters south of Cindy Lane and 297 meters west of I-77 South. The station is located 6.4 kilometers (4.0 miles) North of the central business district of Charlotte, North Carolina. The monitor is located in a large grass field between two baseball fields at Friendship Park. There are no obstructions to air flow near the probe.

The station complies with the siting requirements of 40 CFR §58 Appendices A, C, D, and E for criteria air pollutants ($PM_{2.5}$).

OBJECTIVE AND SPATIAL SCALE

The monitoring objective of the Friendship Park station is to measure $PM_{2.5}$ concentrations in an area of high population density. The station is a neighborhood scale station which represents $PM_{2.5}$ levels over several kilometers. Data from this station is used to assess compliance with the NAAQS for $PM_{2.5}$.

The station is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC, NC; Cabarrus County, NC; Gaston County, NC; Iredell County, NC; Lincoln County, NC; Mecklenburg County, NC; Rowan County, NC; Union County, NC; Chester County, SC; Anson County; Lancaster County, SC; and York County, SC.

STATUS AND RECOMMENDATIONS

The station meets the required monitoring objectives and siting criteria of 40 CFR 58 Appendices A, B, C, D, and E; where applicable, for criteria air pollutants. It is recommended that the current station status be maintained.

(C) Friendship Park Aerial Photograph:

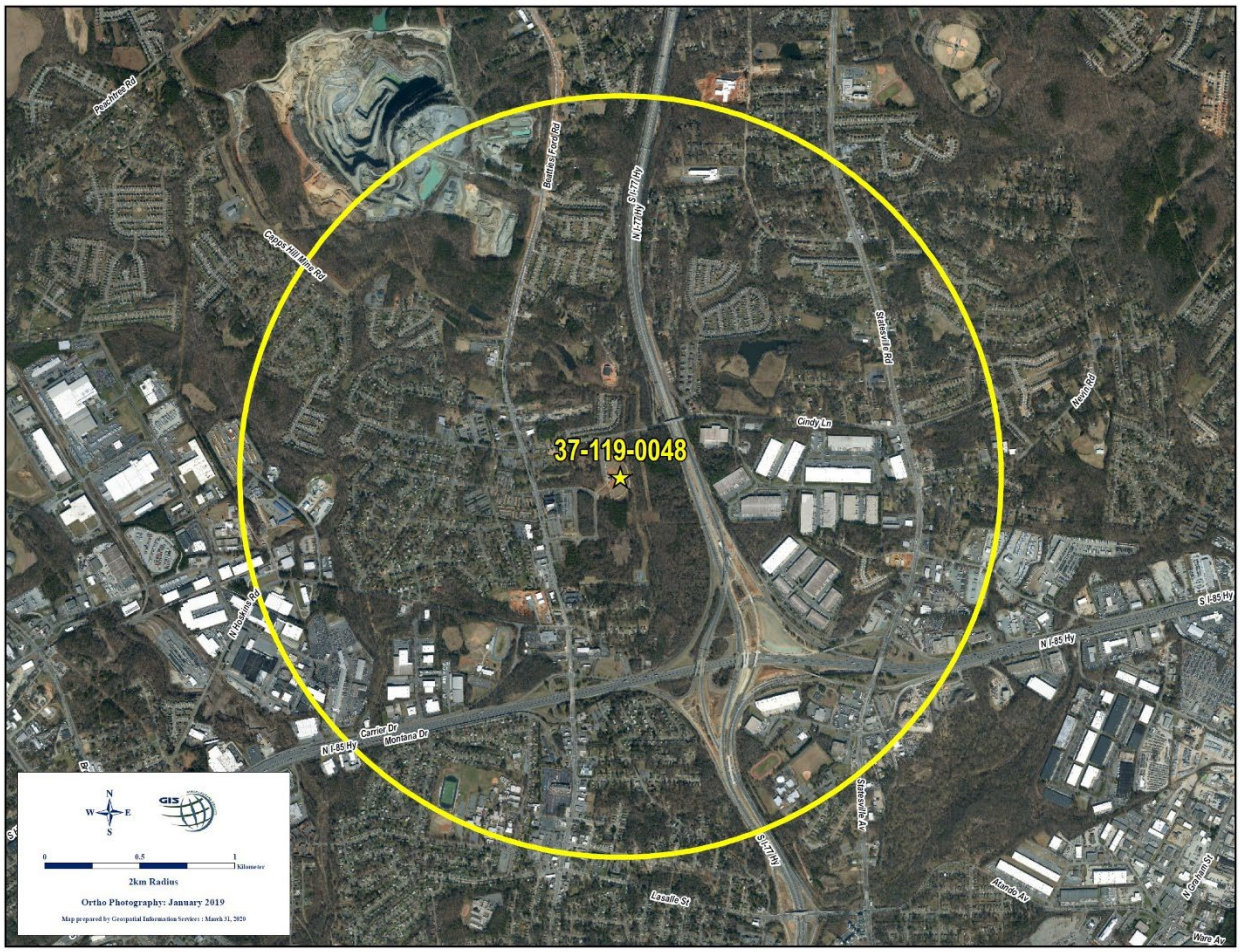

Figure 7. Friendship Park aerial photograph with 4 km diameter circle

(D) Friendship Park Station Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

6. Equipment Drive

(A) Equipment Drive Station Table

Site Name:	Equipment Drive			
AQS Site Identification Number:	37-119-0050			
Location:	Equipment Drive (address approximate)			
	Charlotte, NC 28269			
Latitude:	N 35.27831°	Datum: WGS84		
Longitude:	W -80.79698°			
Elevation:	232 meters			
Parameter	Method	Method Number	Probe Height (m)	Sampling Schedule
NO_2	CAPS	256	4	Continuous
Date Monitor Established:	NO_2	January 1, 2023 (approximate date)		
Nearest Road:	I-85	Distance to Road:	24 meters (approx. distance)	
Traffic Count:	175,000	Year of Count:	2019	
MSA:	Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area (2019)		MSA #:	16740

2020 Population (10 census block groups within 1 mile radius of property)	Projected 2022 Population (10 census block groups within 1 mile radius of property)
24788	25954

(B) Equipment Drive Station Description and Statement of Purpose

The Equipment Drive monitoring station is located in a grassy area adjacent to Interstate 85 South (I-85S) between North Graham Street and West Sugar Creek Road. The station is located 7.0 kilometers NE of the central business district of Charlotte, NC at latitude N 35.27831°and longitude W -80.79698°.

A federal equivalent method (FEM) NO_2 analyzer will be located at the Equipment Drive monitoring station. The NO_2 analyzer monitor type is SLAMS. The NO_2 monitor will be approximately 24 meters from the nearest traffic lane and is designated as a near-road monitoring station for the CBSA.

The station meets the required monitoring objectives and siting criteria of 40 CFR Part 58 for criteria air pollutants (NO_2).

OBJECTIVE AND SPATIAL SCALE
The monitoring objective of the Equipment Drive NO_2 station is to determine the highest concentrations expected to occur in the area covered by the network. The NO_2 station is classified as a microscale station. The Equipment Drive station is representative of nitrogen dioxide concentrations in the near-road environment. Data is used to assess compliance with the nitrogen dioxide NAAQS.

The site is located in the Charlotte-Gastonia-Concord, NC-SC Metropolitan Statistical Area. The principal cities and counties in the MSA are Charlotte, NC; Gastonia, NC; Concord, NC; Rock Hill, SC and Cabarrus County, NC; Gaston County, NC; Iredell County, NC; Lincoln County, NC; Mecklenburg County, NC; Rowan County, NC; Union County, NC; Anson County, NC: Chester County, SC; Lancaster County, SC; and York County.

(C) Equipment Drive Aerial Photograph:

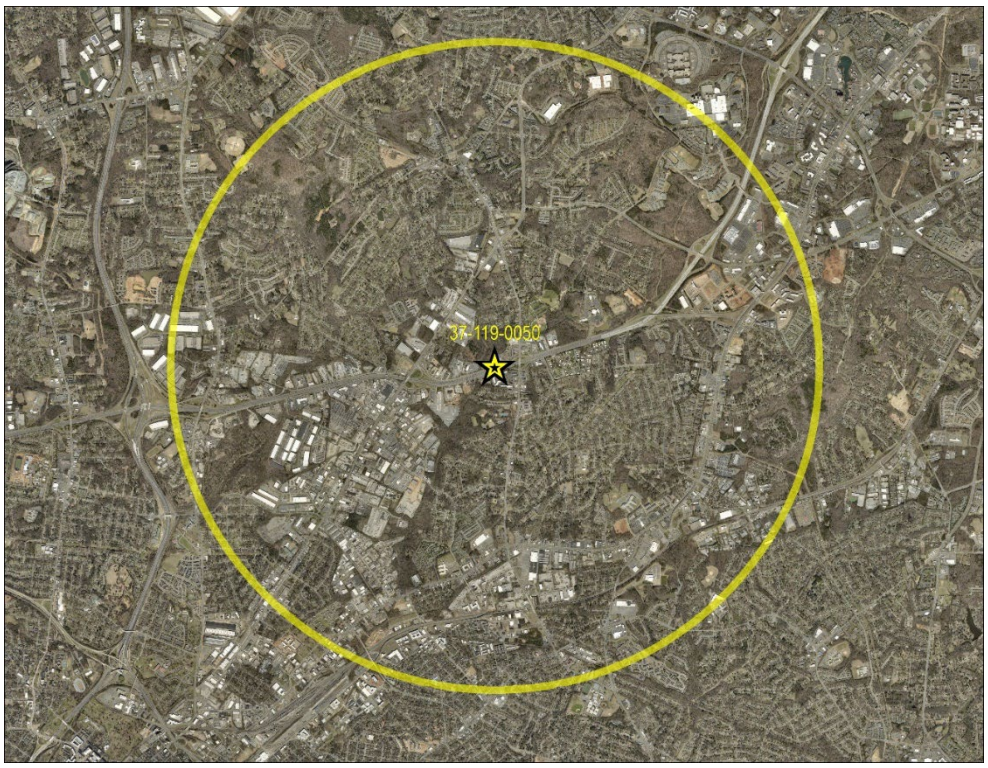

Figure 12. Equipment Drive aerial photograph with 4 km diameter circle

(D) Equipment Drive Site Photographs

NORTH

NORTHEAST

EAST

SOUTHEAST

SOUTH

SOUTHWEST

WEST

NORTHWEST

V. REFERENCES

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3. Connect NCDOT. Urban-Area Traffic Volume Maps. https://connect.ncdot.gov/resources/State-Mapping/Pages/Urban-Area-Traffic-Volume-Maps.aspx . North Carolina Department of Transportation, Raleigh, NC 27699-1501. 2018.

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6. QA Handbook for Air Pollution Measurement Systems: "Volume II: Ambient Air Quality Monitoring Program" EPA-454/B-17-001, January 2017 - Full Document (PDF)

7. Bannister, Beverly. EPA Response Letter to "2018-2019 Monitoring Plan (MCAQ)", October 22, 2018.

8. EPA Extension of Start Date for Photochemical Assessment Monitoring Stations Fact Sheet PDF. https://www.epa.gov/sites/production/files/2019-12/documents/final_pams_extension_fact_sheet.pdf, December 20, 2019.

9. Mecklenburg Demographics Application. http://maps.co.mecklenburg.nc.us/meckdemo/. Mecklenburg County GIS, Charlotte, NC 28208. 2022

VI. APPENDIX A

Monitoring Equipment Replacement Tables

Manufacturer	Type Equipment	Serial #	Asset Number	Model	Site	Date Purchased	Notes	Condition
Additel	Barometer	211H170D0003		681	Suttle-Lab			Good
Agilaire	Airvision Server			AIRVISION1V	Suttle-Lab			Good
Agilent Technologies	GC System	US18403039	69097	78908	Suttle-Lab	09/21/19	Includes Unity XR, CIA Advantage, and Kori XR	Good
AirGas	Gas Cylinder	C-000669	MCAQ#161		Suttle-Lab			Good
AirGuide	Barometer	3		AirGuide	Suttle-Lab			Good
AirGuide	Barometer	4		AirGuide	Suttle-Lab			Good
Alicat Scientific	Alicat Flow Meter	45717		M-10SCCM-D/5M	Suttle-Lab			Good
Alicat Scientific	Alicat Flow Meter	111447		MW-10SCCM-D/5M	Suttle-Lab			Good
Alicat Scientific	Alicat Flow Meter	185930		FP-25BT	Suttle-Lab			Good
Alicat Scientific	Alicat Flow Meter	185931		FP-25BT	Suttle-Lab			Good
Alicat Scientific	Alicat PCU	111448		PCUW-20SCCM-200SCCM-10SLPM-.25SWCOMP	Suttle-Lab			Good
Alicat Scientific	Alicat PCU	111449		PCUW-20SCCM-200SCCM-10SLPM-.25SWCOMP	Suttle-Lab			Good
Alicat Scientific	Alicat PCU	111450		PCUW-20SCCM-200SCCM-10SLPM-.25SWCOMP	Suttle-Lab			Good
Apogee	Sol-a-meter			SP-110	University Meadows			Good
APW McLean	Air Conditioner	04029597-3		CR29-0216-G047	Ramblewood Park			Good
Arc 3 Gases	Gas Cylinder	EB0123168	MCAQ#169	150A	Garinger			Good
Arc3 Gases	Gas Cylinder	EB0061240	MCAQ#168	150A	Remount			Good
Arc3 Gases	Gas Cylinder	ER0004772	MCAQ#173	80A	Garinger			Good
Bard	Air Conditioner	309M112852661-02		W36A1-A05XP4XXJ	Garinger			Good
BGI Instruments	Delta Cal	36		Delta Cal	Suttle-Lab			Good
BGI Instruments	Delta Cal	78		Delta Cal	Suttle-Lab			Good
BGI Instruments	Tetra Cal	345		Tetra Cal	Suttle-Lab			Spare
BGI Instruments	Tetra Cal	365		Tetra Cal	Suttle-Lab			Spare
BGI Instruments	Tetra Cal	441		Tetra Cal	Suttle-Lab			Spare
Bios International Corp	DryCal DC-Lite	7468		DCL-L	Suttle-Lab			Good
Bios International Corp	DryCal DC-Lite	103222		DCL-H	Suttle-Lab			Good
Bios International Corp	Nexus	1071		DCNS	Suttle-Lab			Good
Brunton	Pocket Transit	2611000210		2061	Suttle-Lab			Good

Manufacturer	Type Equipment	Serial #	Asset Number	Model	Site	Date Purchased	Notes	Condition
Chinook Engineering	FTS	777		FTS	Suttle-Lab			Spare
Chinook Engineering	FTS	981023		FTS	Suttle-Lab			Good
Chinook Engineering	FTS	990399		FTS	Suttle-Lab			Good
Chinook Engineering	FTS	981016A		FTS	Suttle-Lab			Good
Chinook Engineering	FTS	H981014A		FTS	Suttle-Lab			Good
Cradlepoint	Cradlepoint	MM130504000352		IBR600lpe	Suttle-lab			Good
Cradlepoint	Cradlepoint	MM160030300417		IBR600lpe	Suttle-Lab			Good
Cradlepoint	Cradlepoint	MM160075900576		IBR600lpe	Suttle-Lab			Good
Cradlepoint	Cradlepoint	WA201800290009		IBR600C-150M-D	Garinger (PAMS)			Good
Cradlepoint	Cradlepoint	WA213700541950		IBR600c	University Meadows			Good
Cradlepoint	Cradlepoint	WA214500574873		IBR600C-150M-D	Ramblewood			Good
Cradlepoint	Cradlepoint	WA213800545056		IBR600C-150M-D	Friendship			Good
Cradlepoint	Cradlepoint	WA213800545139		IBR600C-150M-D	Remount			Good
Cradlepoint	Cradlepoint	WA213800544905		IBR600C-150M-D	Garinger			Good
Cradlepoint	Cradlepoint-Sharon towers	MM16012650037		IBR600lpe	Suttle-Lab			Good
Druck	Barometer	7401000		DPI 740	Suttle-Lab			Good
Druck	Barometer	74001908		DPI 740	Suttle-Lab			Good
Dwyer	Manometer	2		1230	Suttle-Lab			Good
Dwyer	Manometer	4		1230	Suttle-Lab			Good
Dwyer	Manometer	7		1230	Suttle-Lab			Good
Dwyer	Manometer	8		1230	Suttle-Lab			Good
Dwyer	Manometer	9		1230	Suttle-Lab			Good
EKTO	Outdoor Shelter	2331-1	40634	8 X 10 Shelter	Remount	06/01/90	SPS Shelter.	Surplus
EKTO	Outdoor Shelter	3088-1	67178	EKTO/8 X 16	Remount	05/01/99		Surplus
EKTO	Shelter	3278-7		432 SP	Suttle-Lab	11/01/02		Good
EKTO	Shelter	3577-8	67847	432SP	Ramblewood Park			Good
Environics	Environics 9100	1887	63216	9100	Suttle-Lab	11/01/93		Surplus
Environics	Environics 6103	3170	67771	6103	Suttle-Lab	10/01/03		Good

Environics	Environics 6100	4202	63226	6100	Suttle-Lab	04/17/08		Good
Environics	Environics 6100	6527	72399	6100	Garinger	04/30/15		Good
ESC	Data Logger 8832	A0064	67667	8832	Suttle-Lab	06/01/02		Good
ESC	Data Logger 8832	A0160	67697	8832	University Meadows	10/11/02		Good
ESC	Data Logger 8832	A0304	67729	8832	Ramblewood Park	03/26/03		Good
ESC	Data Logger 8832	A0409	67773	8832	Suttle-Lab	10/08/03		Good
Manufacturer	**Type Equipment**	**Serial #**	**Asset Number**	**Model**	**Site**	**Date Purchased**	**Notes**	**Condition**
ESC	Data Logger 8832	A0896	67860	8832	Suttle-Lab	03/08/05		Good
ESC	Data Logger 8832	A2333K	63292	8832	Suttle-Lab	02/07/08		Good
ESC	Data Logger 8832	A4829K	64603	8832	Remount	03/20/14		Good
ESC	Ambient Temperature Sensor	10		103-4000	Suttle-Lab			Good
ESC	Data Logger 8864	C2568	69146	8864	Garinger			Good
ESC	Site Temperature	6		103-4000	University Meadows			Good
Fisher Scientific	Excursion-Trac Thermometer	181376177		15-081-125,15214026	Suttle-Lab			Good
Fisher Scientific	Toxics Flow Meter	292328		520	Garinger			Good
Fluke	Voltmeter	5690145		27	Suttle-Lab			Good
Fluke	Voltmeter	78540313		87III	Suttle-Lab			Good
Fluke	Voltmeter	97410278		87V	Suttle-Lab			Good
Fourtec	Fourtec Thermometer	7014421		EC850	Suttle-Lab			Good
Frost Boats	Trailer	1F9FC1425FG127185	6387		University Meadows	10/13/15		Good
GAST	Compressor	5Z675A		M550EX	Suttle-Lab			Good
Hampshire Controls	Site Temperature	1902-3445-27484		140-100HV-MB	Garinger			Good
Hart Scientific	Micro Bath	A32653		7102	Suttle-Lab		Next priority for replacement.	Good
Jun-Air	Compressor	552774		OF302	Suttle-Lab	04/07/04		Good
Keuffel & Esser Company	Transit	169553		P5137	Suttle-Lab			Good
Markes International	Canister Auto Sampler	GB00H10293-18/11	69097	CIA Advantage-XR	Suttle-Lab	09/21/19		Good
Markes International	Thermal Desorber	GB00U33144-18/11	69097	Unity XR	Suttle-Lab	09/21/19		Good
Markes International	Water Condenser	GB00W10188-18/11	69097	Kori XR	Suttle-Lab	09/21/19		Good
Matrix Inc.	Sol-a-meter	4776		MK 1-G	Suttle-Lab			Good

Matrix Inc.	Sol-a-meter	4998		MK 1-G	Suttle-Lab			Good
Matrix Inc.	Sol-a-meter	5873		MK 1-G	Suttle-Lab			Good
Matrix Inc.	Sol-a-meter	5937		MK 1-G	Garinger			Good
Mesa Laboratories	Definer	111971		Definer 220-L	Suttle-Lab			Good
Mesa Laboratories	Definer	112233		Definer 220-H	Suttle-Lab			Good
Mesa Laboratories	Definer	133693		Definer 220-H	Suttle-Lab			Good
Mesa Laboratories	Definer	133703		Definer 220-L	Suttle-Lab			Good
Manufacturer	**Type Equipment**	**Serial #**	**Asset Number**	**Model**	**Site**	**Date Purchased**	**Notes**	**Condition**
Met One Instruments	SASS	Y4594	67704	SASS	Suttle-Lab	10/01/00		Spare
Met One Instruments	SASS	D7162	67849	SASS	Suttle-Lab	12/07/04		Spare
Met One Instruments	BAM-1020	H1935	63263	1020	Ramblewood Park	04/17/08	Next priority for replacement.	Good
Met One Instruments	SASS	N1099	72214	Super SASS	Garinger	04/11/12		Good
Met One Instruments	BAM-1020	U20336	69786	1020	Garinger	11/23/16		Good
Met One Instruments	BAM-1020	U20337	69787	1020	Garinger	11/23/16		Good
Met One Instruments	BAM-1022	U13546	69784	1022	Friendship Park	11/23/16		Good
Met One Instruments	BAM-1022	X15279	69785	1022	Remount	11/23/16		Good
Met One Instruments	BAM-1020	H7548		BAM 1020	Suttle-Lab			Good
Met One Instruments	Relative Humidity Sensor	R17904		083E-0-35	Garinger			Good
Met One Instruments	Relative Humidity Sensor	R20523		083E-0-35	Suttle-Lab			Good
Met One Instruments	Relative Humidity Sensor	T19893		083E-0-35	Remount			Good
Met One Instruments	Relative Humidity Sensor	Y20492		083E-0-35	Suttle-Lab			Good
Met One Instruments	SASS Temperature Resistance Box	J7455		9099	Suttle-Lab			Good
Met One Instruments	Sonic Anemometer	J6601		50.5H	Remount			Good
Met One Instruments	Sonic Anemometer	R13845		50.5H	Garinger			Good
NovaLynx Corp.	Precipitation Calibrator	946-001		260-2595	Suttle-Lab			Good
NovaLynx Corp.	Precipitation Calibrator	946-002		260-2595	Suttle-Lab			Good
OMEGA	OMEGA Thermometer	98:8B:AD:00:38:94		OM-EL-WIFI-TH-PLUS	Suttle-Lab			Good
Praxair	Gas Cylinder	DT0021631	MCAQ#165	150A	Garinger			Good

Praxair	Gas Cylinder	JB02884	MCAQ#166	50A	Remount			Good
R.M. Young	Barometric Pressure Sensor	BPA 7587		BPA 7587	Garinger			Good
R.M. Young	Temperature Sensor	19041		41342VC	Garinger			Good
R.M. Young	Temperature Sensor	25844		41342VC	Remount			Good
R.M. Young	Tipping Bucket Rain Gauge	TB 05899		52202	Suttle-Lab			Good
R.M. Young	Tipping Bucket Rain Gauge	TB01473		52202	Garinger			Good
RM Young	Sonic Anemometer	UD00004438		86000	Suttle-Lab			Good
Manufacturer	**Type Equipment**	**Serial #**	**Asset Number**	**Model**	**Site**	**Date Purchased**	**Notes**	**Condition**
Sartorius	Balance	20902085	61749	AC2105	Suttle-Lab	06/14/95		Spare
Scott Marrin	Gas Cylinder	CA01400	MCAQ#159	150A	Remount			Good
Scott Marrin	Gas Cylinder	CC105072	MCAQ#162	150A	Garinger			Good
Scott Marrin	Gas Cylinder	CC37915	MCAQ#148	150A	Garinger			Good
Scott Marrin, Inc	Gas Cylinder	CC106586	MCAQ#95	150A	Suttle-Lab			Good
Scott Marrin, Inc	Gas Cylinder	CC42695	MCAQ#164	150A	Suttle-Lab			Good
Scott-Marrin, Inc	Gas Cylinder	CC286	MCAQ#152	150A	Suttle-Lab			Good
Scott-Marrin, Inc	Gas Cylinder	CC89561	MCAQ#158	150A	Suttle-Lab			Good
Scott-Marrin, Inc	Gas Cylinder	JJ21192	MCAQ#150	50A	Suttle-Lab			Good
Shelter One	Shelter	20053-01		C1152095 20053	Garinger	12/01/11		Good
Shelter One	Shelter	23053-01	66088	C101695 23053	Remount	04/09/14		Good
Shelter One	Shelter	25040-01	72258	MMS8 25040	University Meadows	10/13/15		Good
Teledyne Hastings-Raydist	Bubble Meter	549		HBM-1A	Suttle-Lab			Good
Teledyne Instruments	CO Analyzer	68	67861	300EU	Suttle-Lab	03/11/05		Spare
Teledyne Instruments	Zero Air System	2809	64822	M701H	Suttle-Lab	10/17/08	Next priority for replacement	Good
Teledyne Instruments	Zero Air System	3033	67371	M701H	Garinger	11/05/09	Next priority for replacement	Good
Teledyne Instruments	Zero Air System	3035	67371	M701H	University Meadows	11/05/09	Next priority for replacement	Good
Teledyne Instruments	Zero Air System	98	72991	M701H	Suttle-Lab	10/26/10	Next priority for replacement	Good
Teledyne Instruments	NO2 Analyzer	81	69969	T200UP	Remount	08/26/13		Good
Teledyne Instruments	T700U Calibrator	182	64608	T700U	Remount	01/20/14		Good

Teledyne Instruments	T700U Calibrator	725		T700U	Suttle-Lab		For 2nd Near-road NO2 site	Good
Teledyne Instruments	Zero Air System	793	64609	M701H	Remount	01/20/14		Good
Teledyne Instruments	NO2 Analyzer	114		T200U	Garinger			Good
Teledyne Instruments	SO2 Analyzer	101		T100U	Suttle-Lab			Good
Teledyne Instruments	NO2 Analyzer	93		N500	Garinger			Good
Teledyne Instruments	NO2 Analyzer	115	70059	N500	Remount			Good
Thermo	Ozone Analyzer	49C-56618-309	66331	49C	Suttle-Lab	11/01/96		Spare
Thermo	Ozone Primary Standard	49CPS-56545-309	66332	49CPS	Suttle-Lab	11/01/96		Spare Parts
Thermo	Ozone Primary Standard	49CPS-73995-375	67660	49C	Suttle-Lab	04/01/02		Spare Parts
Thermo	Ozone Primary Standard	49CPS-73996-375	67658	49CPS	Suttle-Lab	04/01/02		Good
Manufacturer	**Type Equipment**	**Serial #**	**Asset Number**	**Model**	**Site**	**Date Purchased**	Next priority for replacement.	**Condition**
Thermo	Ozone Primary Standard	49CPS-73997-375	67659	49CPS	Suttle-Lab	04/01/02		Good
Thermo	FRM	2025B217200408	67843	2025B	Suttle-Lab	11/03/04		Spare
Thermo	Ozone Analyzer	432209351	67841	49C	Suttle-Lab	11/23/04		Spare Parts
Thermo	Ozone Primary Standard	432209352	67842	49CPS	Suttle-Lab	11/23/04		Good
Thermo	Ozone Analyzer	636319876	67965	49I	Suttle-Lab	12/22/06		Good
Thermo	Ozone Analyzer	636319877	67966	49I	Suttle-Lab	12/22/06		Spare
Thermo	146I Gas Calibrator	717821846	68014	146I	Suttle-Lab	06/30/07		Spare
Thermo	Ozone Primary Standard	734726810	99068	49IPS	Suttle-Lab	01/14/08		Good
Thermo	FRM	2025B219590706		2025B	Suttle-Lab	05/01/08		Spare
Thermo	FRM	2025B221720804	68066	2025B	Suttle-Lab	06/11/08		Spare
Thermo	FRM	2025B226221002	66044	2025B	Suttle-Lab	05/13/10		Spare
Thermo	Ozone Primary Standard	1027444721		49IPS	Garinger	01/01/11	Next priority for replacement	Good
Thermo	NOy Analyzer	1213152833	72314	42IY	Garinger	06/20/12		Good
Thermo	SO2 Analyzer	1213152834	72361	43I	Garinger	07/17/12		Good
Thermo	CO Analyzer	1220753779	72356	48I	Garinger	10/17/12		Good
Thermo	FRM	2025I2 02341205	72358	2025I	Garinger	10/24/12	Next priority for replacement.	Good
Thermo	Ozone Analyzer	1152660035	72272	49I	Garinger	01/13/16		Good
Thermo	NO2 Analyzer	1153170016	69870	42I	Suttle-Lab	01/13/16		Spare

Thermo	Ozone Primary Standard	1153380012	72256	49IPS	University Meadows	02/02/16		Good
Thermo	Ozone Analyzer	728225131	68048	49I	University Meadows	10/22/17		Good
Thermo	CO Analyzer	1502064047	201077	48I-TLE	Remount	Monitoring began 01/01/2017	On loan from NCDAQ-Near-road CO.	Good
Thermo	FRM	2025IW2 0996 1603	300348	2025IW	Remount	Monitoring began 01/01/2017	On loan from NCDAQ-Near-road PM 2.5.	Good
Thermo	Zero Air System	111-28998-233		111	Suttle-Lab			Good
Thermo Environmental	PM2.5 FRM	2025A204679807	67702	2025a	Suttle-Storage	10/01/98		Spare
Thermo-GAST	Laboratory Compressor	NXGTE-4870			Suttle-Storage			Spare
Transcat	Voltage Calibrator	9733019		23894E	Suttle-Lab			Good
URG Corp.	URG	3N-B0428		URG-3000N	Suttle-Lab	02/01/09		Spare
URG Corp.	URG	3N-B0524		3N-3000N	Garinger		Next priority for replacement.	Good
Vaisala	Humidity Calibrator	M210185en-A		HMK15	Suttle-Lab			Good
Manufacturer	**Type Equipment**	**Serial #**	**Asset Number**	**Model**	**Site**	**Date Purchased**	**Notes**	**Condition**
Vaisala	Relative Humidity Wand	R3340580		HM70	Suttle-Lab			Good
Vaisala	Relative Humidity Wand	R3340581		HM70	Suttle-Lab			Good
Vaisala	Ceilometer	S3240436		CL51	Garinger	07/30/20		Good
VWR	Barometer	5		15551-024	Suttle-Lab			Good
VWR	Thermometer	90185236		61220-601	Suttle-Lab			Good
VWR	Thermometer	130189334		61220-601	Suttle-Lab			Good
VWR	Thermometer	140432915		61220-601	Suttle-Lab			Good
Xonteck	Toxics			911	Garinger			Good
Xonteck	Toxics			911	Oehler		On loan from NCDAQ for pipeline spill site SPM	Good
	Community Science Station				Garinger			Good
	Visibility Camera- Sharon towers				Suttle-Lab			Good

Item	Manufacturer	Model	SN	Location	Notes	Condition
Router	Cradlepoint	IBR600c	WA192300160072	Friendship Park		Good
APC Power Supply	Cyberpower	1350AVR	CPK0U2001746	Garinger		
Computer	Dell	Optiplex 3020 D08U	6CPJD42	Garinger		Good
Serial to USB Converter	MOXA Uport	1610-8	TAFEB1096303	Garinger		Good
Router	Cradlepoint	IBR600	MM130504000352	Garinger		Good
External Hard Drive	Western Digital	My Book	WCAZA7858581	Garinger		Good
Computer	Dell	Latitude 5400	JKQ3P13	Jeff Francis		Good
Computer	Microsoft	Surface Pro	37926164353	Kelly Grass		Good
Computer	Dell	Latitude 2 in 1	660PTT2	Kevin Dunham		Good
Computer	Dell	Latitude 2 in 1	FYVRMQ2	Kileigh Welshofer		Good
Computer	Dell	Latitude E5440	FKLXN32	Ramblewood Park		Good
Router	Cradlepoint	IBR600c	WA192300160121	Ramblewood Park		Good
APC Power Supply	Cyberpower	1000VA CP1000AVRLCDa	CTKGW2001559	Remount		Good
Computer	Dell	Optiplex 3020 D08U	D73P942	Remount		Good
Router	Cradlepoint	IBR600	MM160030300417	Remount		Good
External Hard Drive	Western Digital	MY Book	WMAZA5746783	Remount		Good
Router	Cradlepoint	IBR600	MM16012650037	Sharon Towers		Good
AirVision Software	Agilaire			Suttle-Lab		Good
Old AV Server	Dell	Optiplex 790 D05D	3J9B5V1	Suttle-Lab		Good
Temperature Log	Dell	D08U	D73R942	Suttle-Lab		Good
Printer Computer	Dell	D08U	BQGFH03	Suttle-Lab		Good
Router	NetGear M-MBR624GU		20V1947V01081	Suttle-Lab		Good
APC Power Supply	Tripp Lite SMART1500LCDT		2627EVLSM871901794	Suttle-Lab		Good
WD My Book			WMCDS0728465	Suttle-Lab		Good
Computer	Microsoft Surface Pro		66239254153	Suzanne Hollenbeck		Good
Dell Optiplex 3020	D08U		D71R942	University Meadows		Good
Router	Cradlepoint	IBR600	MM160075900576	University Meadows		Good

VII. APPENDIX B

Memorandum of Agreement

MEMORANDUM OF AGREEMENT

ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR

THE CHARLOTTE-CONCORD-GASTONIA

METROPOLITAN STATISTICAL AREA (MSA)

July 1, 2016

Participating Agencies:

North Carolina
Department of Environmental Quality (NCDEQ)
Division of Air Quality (NCDAQ)

South Carolina
Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality

Mecklenburg County, North Carolina
Land Use and Environmental Services Agency
Air Quality (MCAQ)

I. PURPOSE/OBJECTIVES/GOALS

The purpose of this Memorandum of Agreement (MOA) is to establish the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement among NCDAQ, SCDHEC, and the MCAQ (collectively referred to as the "affected agencies") to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for criteria pollutants deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will renew the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Charlotte-Concord-Gastonia MSA as required by 40 CFR 58 Appendix D, Section 2(e).

II. BACKGROUND

The Charlotte-Concord-Gastonia MSA consists of

Cabarrus County, NC
Gaston County, NC
Iredell County, NC
Lincoln County, NC
Mecklenburg County, NC
Rowan County, NC
Union County, NC
Chester County, SC
Lancaster County, SC

York County, SC

NCDAQ has jurisdiction over Cabarrus, Gaston, Iredell, Lincoln, Rowan, and Union Counties; SCDHEC has jurisdiction over Chester, Lancaster, and York Counties; MCAQ has jurisdiction over Mecklenburg County.

The NCDAQ, SCDHEC, and MCAQ are required by the Clean Air Act to measure for certain criteria pollutants in the ambient air in the Charlotte-Concord-Gastonia MSA. The EPA has established minimum monitoring requirements based on the size of the MSA and the quality of the air in the MSA.

40 CFR 58 Appendix D, Section 2 (e) states (in part):

> "... The EPA recognizes that State or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator."

Currently each air pollution control agency (affected agency) conducts monitoring in its respective jurisdiction and coordinates monitoring with the other air pollution control agencies within the MSA.

III. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

- NCDAQ, SCDHEC, and MCAQ (the "affected agencies") commit to conducting appropriate monitoring in their respective jurisdictions of the MSA; as needed, to collectively meet EPA minimum monitoring requirements for the entire MSA for criteria air pollutant monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all affected agencies. The minimum air quality monitoring requirements for the MSA shall apply to the MSA in its entirety and shall not apply to any sole affected agency within the MSA unless agreed upon by all affected agencies.

- The affected agencies commit to coordinating monitoring responsibilities and requirements to achieve an effective network design regarding criteria air pollutant monitoring conducted in the MSA and commit to communicate unexpected or unplanned changes in monitoring activities within their jurisdictions to the other affected agencies. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected party shall inform the others via telephone or e-mail of any monitoring changes occurring in its jurisdiction of the MSA at its earliest convenience after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to

natural disaster, or similar occurrences that result in extended change (greater than one quarter) or permanent change in the monitoring network. At least once a year in the second quarter or before June 15th, each agency shall make available to the other agency a copy of its proposed monitoring plan for its jurisdiction with the MSA for the next year.

- Each party reserves the right to revoke or terminate this MOA at any time for any reason by giving thirty (30) days written notice prior to the date of termination.

IV. LIMITATIONS

A. All commitments made in this MOA are subject to the availability of funds and each party's budget priorities. Nothing in this MOA, in and of itself, obligates NCDAQ, SCDHEC, or MCAQ to expend funds or to enter into any contract, assistance agreement, interagency agreement, or other financial obligation.

B. This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this MOA will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements what will be effected in writing by representatives of the parties.

C. Except as provided in Section III, this MOA does not create any right or benefit, substantive or procedural, enforceable by law or equity against NCDAQ, SCDHEC, or MCAQ, their officers or employees, or any other person. This MOA does not direct or apply to any person outside NCDAQ, SCDHEC, or MCAQ.

V. PROPRIETARY INFORMATION AND INTELLUCTUAL PROPERTY

No proprietary information or intellectual property is anticipated to arise out of this MOA.

VI. POINTS OF CONTACT

The following individuals are designated points of contact for the MOA:

NCDEQ DAQ: Joette Steger
NC DENR Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

joette.steger@ncdenr.gov
Voice/fax: 919-707-8449

SCDHEC: Scott Reynolds
SCDHEC Bureau of Environmental Health Services
2600 Bull Street
Columbia, SC 29201

reynolds@dhec.sc.gov
Voice: 803-896-0902

MCAQ: Jeff Francis
Mecklenburg County Land Use and Environmental Services Agency – Air Quality
2145 Suttle Avenue
Charlotte, NC 28208-5237

Jeff.Francis@mecklenburgcountync.gov
Phone 704-336-5430
Fax 704-336-4391

In the event that a point of contact needs to be changed, notification may be made via email to the other parties.

VII. MODIFICATION/DURATION/TERMINATION

This MOA will be effective when signed by all parties. This MOA may be amended at any time by the mutual written consent of all parties. The parties will review this MOA at least once every 10 years to determine whether it should be revised, renewed, or cancelled. This MOA may be revoked or terminated by an affected party at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

VIII. REFERENCE

United States Environmental Protection Agency, Title 40 Code of Federal Regulations, Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 2 (e), "General Monitoring Requirements"

IX. APPROVALS

North Carolina Department of Environmental Quality
Division of Air Quality (NCDAQ)

BY: Sheila C. Holman

TITLE: Director, Division of Air Quality

DATE: 6/27/2016

South Carolina Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality

BY: [signature]

TITLE: Chief, Bureau of Air Quality

DATE: 07/05/2016

Mecklenburg County Land Use and Environmental Services Agency – Air Quality (MCAQ)
Mecklenburg County Air Quality

BY: [signature]

TITLE: Director, Air Quality

DATE: 6/29/2016

D H E C

PROMOTE PROTECT PROSPER

Catherine E. Heigel, Director

Promoting and protecting the health of the public and the environment

MEMORANDUM

July 5, 2016

Subject: Change of Point of Contact for South Carolina

Memorandum of Agreement on Air Quality Monitoring for Criteria Pollutants for the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA)

From: Rhonda B. Thompson, SC DHEC
Chief, Bureau of Air Quality

As of July 5, 2016, the Point of Contact for South Carolina will be Micheal Mattocks, instead of Scott Reynolds.

Micheal's contact information is below:

Micheal Mattocks
SC DHEC – Bureau of Environmental Health Services
2600 Bull Street
Columbia, SC 29201
(803)896-0856
mattock@dhec.sc.gov

MECKLENBURG COUNTY
Land Use and Environmental Services Agency
-AIR QUALITY-
May 19, 2021

MEMORANDUM

To: Participating Agencies:
North Carolina
Department of Environmental Quality (NCDEQ)
Division of Air Quality (NCDAQ)

South Carolina
Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality

From: Leslie H. Rhodes, Division Director
Mecklenburg County Air Quality (MCAQ)

Subject: Change Point of Contact for MCAQ
Memorandum of Agreement on Air Quality Monitoring for Criteria Pollutants for the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA)

As of May 17, 2021, the Point of Contact for MCAQ will be Danielle Jones, instead of Jeff Francis. Danielle's contact information is below.

Danielle Jones
Air Monitoring Program Manager
MCAQ
2145 Suttle Avenue
Charlotte, NC 28208
980-314-3355
daniellem.jones@mecknc.gov

ROY COOPER
Governor
DIONNE DELLI-GATTI
Secretary
MICHAEL ABRACZINSKAS
Director

NORTH CAROLINA
Environmental Quality

May 20, 2021

MEMORANDUM

TO: Participating Agencies:

South Carolina
Department of Health and Environmental Control (SCDHEC)
Bureau of Air Quality

Mecklenburg County
Land Use and Environmental Services Agency
Air Quality

FROM: Michael Abraczinskas, Director DS MA 5/20/2021
North Carolina Division of Air Quality (NCDAQ)

SUBJECT: Change Point of Contact for NCDAQ
Memorandum of Agreement on Air Quality Monitoring for Criteria Pollutants for the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA)

The Point of Contact for NCDAQ is Patrick Butler instead of Joette Steger. Patrick's contact information is below:

Patrick Butler, P.E.
Ambient Monitoring Section Chief
NCDAQ
1641 Mail Service Center
Raleigh, NC 27699-1641

Patrick.Butler@ncdenr.gov
Voice/fax: 919-707-8719

VIII. APPENDIX C

Site Review Forms Calendar Year 2022

Site Review Form Calendar Year 2022
Garinger 37-119-0041

Region MCAQ	**Site Name** Garinger	**AQS Site #** 37-119-0041
Street Address: 1130 Eastway Dr		**City:** Charlotte
Urban Area CHARLOTTE	**Core-based Statistical Area** Charlotte-Concord-Gastonia, NC-SC	

Enter Exact		**Method of Measuring**	
Longitude W80.785683	**Latitude** N35.240100		
In Decimal Degrees	In Decimal Degrees	Other (explain)	**Explanation**: Google Maps

Elevation Above/below Mean Sea Level (in meters) 232

Name of nearest road to inlet probe Shamrock Dr AADT 9,700 Year latest available 2020

Comments: _____

Distance of site to nearest major road (m) 452 Direction from site to nearest major road NE

Name of nearest major road E. Sugar Creek Rd AADT 15600 Year latest available 2019

Comments: AADT from CDOT

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track	(m) 645 Direction to RR NE ☐NA
Distance of site to nearest power pole w/transformer	(m) NA Direction

Distance between site and drip line of water tower (m) Direction from site to water tower ☒**NA**

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Parameters	**Monitoring Objective**	**Scale**	**Monitor Type**
☐ NA ☒ SO_2 (trace-level) ☒ NO_2 (NAAQS) ☒ O_3 ☐ Hydrocarbon ☒ VOCs ☒ Aldehydes ☒ CO (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☒ Max O3 ConcentrationO3 ☒ Population Exposure All ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ Neighborhood All ☐ Urban_____ ☐ Regional_____	☒ SLAMS NOx, ☐ SPM **Monitor Network Affiliation** ☒ NCORE SO2,O3,CO, ☒ PAMSVOCs and Aldehydes

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐ Give actual measured height from ground (meters) O3 -4.3 m, CO, SO2, NO2 – 4.2 m. GC 4.1 m

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe to supporting structure (meters) O3 - 1.5 m, CO, SO2, NO2 -1.3 m, GC 1.2 m

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) Direction from probe to tree ___ *Height of tree (m)

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2022
Garinger 37-119-0041

Parameters	Monitoring Objective	Scale	Monitor Type
☐ NA ☒ NO_y (trace-level)	☐ General/Background_____ ☐ Highest Concentration_____ ☐ Max O3 Concentration_____ ☒ Population Exposure NOy ☐ Source Oriented_____ ☐ Transport_____ ☐ Upwind Background_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ Neighborhood NOy ☐ Urban_____ ☐ Regional_____	☐ SLAMS _____ ☐ SPM_____ **Monitor Network Affiliation** ☒ NCORE NOY

Probe inlet height (from ground) 10-15 m? Yes ☐ No ☒
Actual measured distance from probe inlet to ground (meters) 7.0

Distance of outer edge of probe inlet from horizontal and/or vertical supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 4.1 m

---

Distance of outer edge of probe inlet from other monitoring probe inlets > 1 m? Yes ☒ No ☐ NA ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐

*Distance from probe to tree (m) Direction from probe to tree *Height of tree (m)

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 298 Direction from probe to nearest traffic lane SE

Site Review Form Calendar Year 2022
Garinger 37-119-0041

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☒ PM2.5 FRM ☐ PM10 FRM ☒ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☒ PM10-2.5 BAM ☒ PM2.5 Cont. (BAM) ☒ PM2.5 Spec. (SASS) ☒ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec. ☐ PM2.5 Cont. Nitrate ☐ PM2.5 Cont. Sulfate ☐ PM2.5 Aethalometer	☐ General/Background _____ ☐ Highest Concentration _____ ☒ Population Exposure All ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts	☐ Micro _____ ☐ Middle _____ ☒ Neighborhood All ☐ Urban _____ ☐ Regional _____	☒ SLAMS BAMPM10, BAM PM2.5, BAMPM10-2.5 ☐ SPM **Monitor Network Affiliation** ☒ NCORE PM2.5 FRM, PM2.5 SASS, PM2.5 URG ☐ SUPPLEMENTAL SPECIATION PM2.5 SASS, PM2.5 URG are CSN **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) BAM 2.5 -5.1 m, BAM PM10 – 5.0 m, FRM 2.5, URG – 5.1 m, SASS 4.8 m

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (m) BAM 2.5 -2.2 m, BAM PM10 – 2.1 m, FRM 2.5, URG – 2.2 m, SASS 1.9 m

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☒ (answer *'d questions) No ☐ NA ☐
* Distance between collocated PM 2.5 samplers within 1 to 4 m of each other? FRM vs BAM PM2.5 Yes ☒ No ☐ Give actual (meters) 1.4
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☒ No ☐ Give actual (meters) 0.1

Is a URG 3000 monitor collocated with a SASS monitor at the site? *Yes ☒ (answer *'d questions) No ☐ NA ☐
* Distance between collocated speciation samplers within 1 to 4 m of each other? Yes ☒ No ☐
Give actual (meters) 1.1
* Are collocated speciation sampler inlets within 1 m vertically of each other? Yes ☒ No ☐ Give actual (meters) 0.3

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? BAM-1020 *Yes ☒ (answer *'d questions) No ☐ NA ☐
* Distance between collocated PM10 and PM2.5samplers for PM10-2.5 within 1 to 4 m of each other? Give actual (meters) 1.0 Yes ☒ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☒ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) Direction from probe to tree *Height of tree (m)

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒
*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐
Distance of probe to nearest traffic lane (m) 298 Direction from probe to nearest traffic lane SE

Site Review Form Calendar Year 2022

Garinger 37-119-0041

COMMENTS: Air Toxic Canister samples collected for NCDAQ. PM2.5 BAM 1020 is the primary monitor at this site. PAMS monitoring started 06/01/21, including ceilometer.

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☐-

*3) Change scale of representativeness? Yes ☐ (enter new scale) No ☐

*4) Relocate site? Yes ☐ No ☐

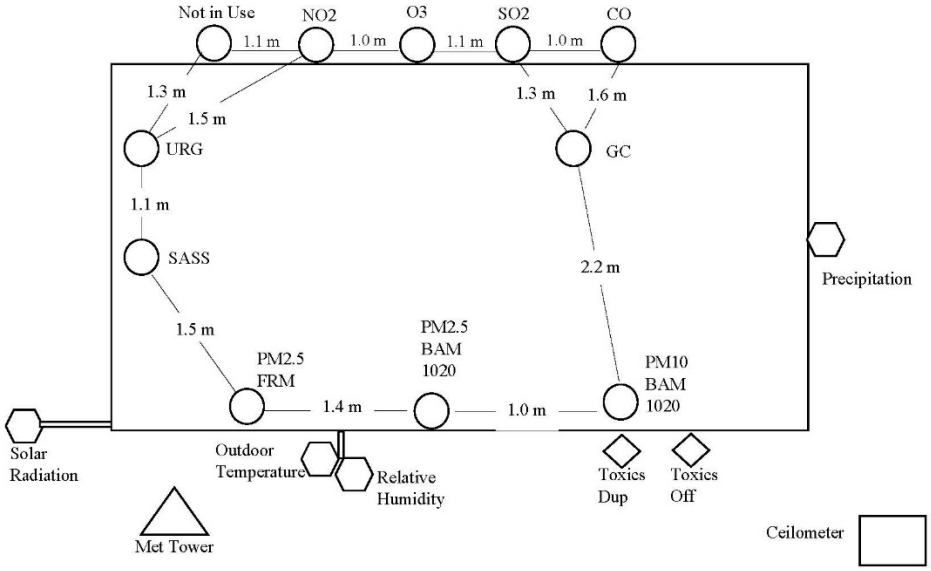
Date of Last Site Pictures: 03/14/22 New Pictures Submitted? Yes ☒ No ☐

Reviewer: Suzanne Hollaka Date: 03/29/22

Ambient Monitoring Coordinator: Danielle Jones Date: 5/16/2022

Garinger

37-119-0041



Site Review Form Calendar Year 2022

Remount 37-119-0045

Region MCAQ	**Site Name** Remount	**AQS Site #** 37-119-0045
Street Address 1030 Remount Road		**City** Charlotte
Urban Area CHARLOTTE	**Core-based Statistical Area** Charlotte-Concord-Gastonia, NC-SC	

Enter Exact		**Method of Measuring**	
Longitude W80.874084°	**Latitude** N35.213171°		
In Decimal Degrees	In Decimal Degrees	**Other (explain)**	**Explanation:** Google Maps
Elevation Above/below Mean Sea Level (in meters)		194	

Name of nearest road to inlet probe I-77 South AADT 119000 Year latest available 2020
Comments: _____
Distance of site to nearest major road (m) 35 Direction from site to nearest major road SE
Name of nearest major road _____ AADT _____ Year _____
Comments:

Site located near electrical substation/high voltage power lines? Yes ☐ No ☒

Distance of site to nearest railroad track	(m) _____ Direction to RR ___ ☒NA
Distance of site to nearest power pole w/transformer	(m) NA Direction ___

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Parameters	Monitoring Objective	Scale	Monitor Type
☒NO_2 (Near Road only) ☒CO (Near Road only)	☒Highest Concentration NO2,CO ☐Population Exposure_____ ☐Source Oriented_____ ☐Transport_____ ☐Welfare Related Impacts _____	☒Micro NO2, CO	☒SLAMS NO2, CO ☐SPM_____

Probe inlet height (from ground) 2-7 m? Yes ☒ No ☐ Give actual measured height from ground (meters) CO – 4.3 m NO2 – 4.4 m
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) CO – 1.5 m NO2 -1.7 m
Distance of outer edge of probe inlet from other monitoring probe inlets > 0.25 m? Yes ☒ No ☐ NA ☐
Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)
*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____
Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒
*Identify obstacle _____ Distance from probe inlet (m) _____ Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐
Distance of probe to nearest traffic lane (m) 35 Direction from probe to nearest traffic lane SE

Site Review Form Calendar Year 2022

Remount 37-119-0045

Parameters	Monitoring Objective	Scale	Site Type
☐ NA Air flow < 200 L/min ☒ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☐ PM10 Lead (PB) ☐ PM2.5 Cont. (TEOM) ☒ PM2.5 Cont. (BAM) ☐ PM2.5 Spec. (SASS) ☐ PM2.5 Spec. (URG) ☐ PM2.5 Cont. Spec.	☐ General/Background _____ ☒ Highest Concentration PM2.5 FRM, PM2.5 BAM ☐ Population Exposure _____ ☐ Source Oriented _____ ☐ Transport _____ ☐ Welfare Related Impacts _____	☒ Micro PM2.5 FRM, PM2.5 BAM	☒ SLAMS PM2.5 FRM, PM2.5 BAM ☐ SPM_____ **Monitor Network Affiliation** ☐ SUPPLEMENTAL SPECIATION_____ **Monitor NAAQS Exclusion** ☐ NONREGULATORY_____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m _____
Actual measured distance from probe inlet to ground (meters) 2.1
Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m? Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 2.1

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☒ (answer *'d questions) No ☐ NA ☐

* Distance between collocated PM 2.5 samplers within 1 to 4 m of each other? FRM vs BAM PM2.5 Yes ☒ No ☐ Give actual (meters) 1.8

*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Yes ☒ No ☐ Give actual (meters) 0.1

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☐ NA ☒

* Distance between collocated PM10 and PM2.5samplers for PM10-2.5 within 1 to 4 m of each other? Give actual (meters) Yes ☐ No ☐

*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle ____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Distance of probe to nearest traffic lane (m) 35 Direction from probe to nearest traffic lane SE

Site Review Form Calendar Year 2022

Remount 37-119-0045

COMMENTS: NA

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective _____) No ☐-

*3) Change scale of representativeness? Yes ☐ (enter new scale) No ☐

*4) Relocate site? Yes ☐ No ☐

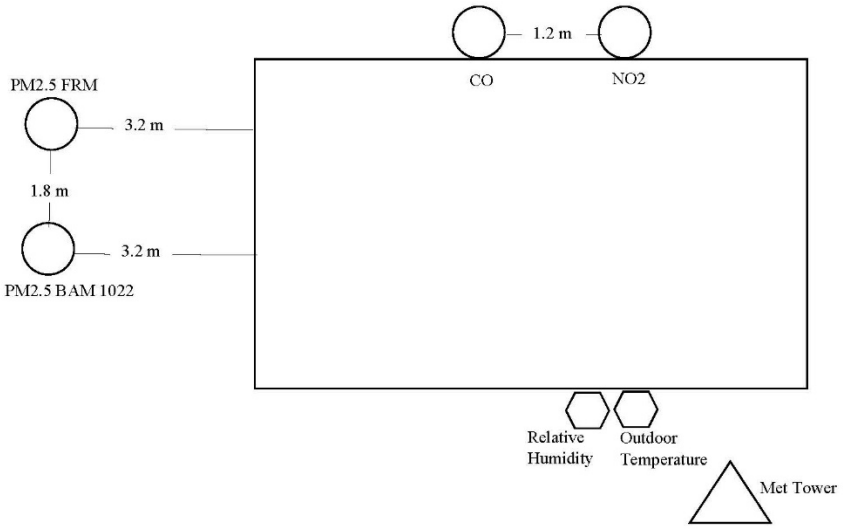
Date of Last Site Pictures: 03/07/22 New Pictures Submitted? Yes ☒ No ☐

Reviewer: Suzanne Hollister Date: 03/29/22

Ambient Monitoring Coordinator: Danielle Jones Date: 5/16/2022

Remount

37-119-0045



Site Review Form Calendar Year 2022

University Meadows 37-119-0046

Region MCAQ	**Site Name** University Meadows	**AQS Site #** 37-119-0046
Street Address 1660 Pavilion Boulevard		**City** Charlotte
Urban Area CHARLOTTE	**Core-based Statistical Area**	Charlotte-Gastonia-Concord, NC-SC

Enter Exact		**Method of Measuring**	
Longitude W 80.713469°	**Latitude** N35.314158°		
In Decimal Degrees	In Decimal Degrees	Other (explain)	**Explanation:** Google Maps

Elevation Above/below Mean Sea Level (in meters) 216

Name of nearest road to inlet probe Pavilion Blvd CDOT: AADT 9200 Year latest available 2016

Distance of ozone probe to nearest traffic lane (m) 47 Direction from ozone probe to nearest traffic lane E

Comments: _____

Name of nearest major road Hwy 485 AADT 85500 Year 2020

Distance of site to nearest major road (m) 342 Direction from site to nearest major road E

Comments: CDOT: Hwy 49 is 340 m South of the site. AADT 27600 Year 2020

Site located near electrical substation/high voltage power lines?	Yes ☐ No ☒
Distance of site to nearest railroad track	(m) 394 Direction to RR SSW ☐NA
OPTIONAL Distance of site to nearest power pole w/transformer	NA (m) _____ Direction ___
Distance between site and drip line of water tower (m)	Direction from site to water tower ☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Parameters	Monitoring Objective	Scale	Site Type
☒ O_3	☐General/Background ☐Highest Concentration ☒Max O3 Concentration ☐Population Exposure ☐Source Oriented ☐Transport ☐Upwind Background ☐Welfare Related Impacts	☐Micro ☐Middle ☐Neighborhood ☒Urban ☐Regional	☒SLAMS ☐SPM

Probe inlet height (from ground) 2-15 m? Yes ☒ No ☐

Give actual measured height from ground (meters) 4.2

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (roof) supporting structure > 1 m? Yes ☒ No ☐

Actual measured distance from outer edge of probe to supporting structure (meters) 1.1

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐ *Number of trees within 10 meters _____

*Distance from probe to closest tree (m) _____ Direction from probe to tree ___ *Height of tree above probe (m) _____

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___

*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2022

University Meadows 37-119-0046

COMMENTS: A solar radiation sensor is also located at this site.

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective:) No ☐

*3) Change scale of representativeness? Yes ☐ (enter new scale:) No ☐

*4) Relocate site? Yes ☐ No ☐

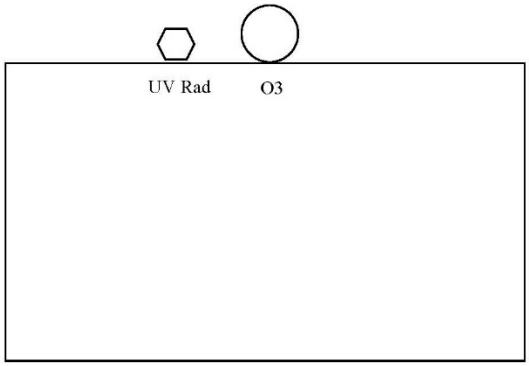
Date of Last Site Pictures: 03/14/22 New Pictures Submitted? Yes ☒ No ☐

Reviewer: Suzanne Hollabaugh Date: 03/29/22

Ambient Monitoring Coordinator: Danielle Jones Date: 5/16/2022

University Meadows

37-119-0046



Site Review Form Calendar Year 2022
Ramblewood Park 37-119-0047

Region MCAQ	**Site Name** Ramblewood Park		**AQS Site #** 37-119-0047
Street Address			**City** Charlotte
Urban Area CHARLOTTE		**Core-based Statistical Area**	Charlotte-Gastonia-Concord, NC-SC
Enter Exact			
Longitude W 80.907577	**Latitude** N 35.123954		**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	Other (explain)	**Explanation**: Google Maps
Elevation Above/below Mean Sea Level (in meters)			179

Name of nearest road to inlet probe I-485 AADT 122,000 Year latest available 2020

Distance of probe to nearest traffic lane (m) 238 Direction from inlet to nearest traffic lane SW

Comments: _____

Name of nearest major road _____ AADT _____ Year latest available _____

Distance of site to nearest major road (m) _____ Direction from site to nearest major road ___

Comments:

Site located near electrical substation/high voltage power lines?	Yes ☐	No ☒
Distance of site to nearest railroad track	(m)___Direction to RR ___	☒NA
Distance of site to nearest power pole w/transformer	(m) NA Direction	
Distance between site and drip line of water tower (m)	Direction from site to water tower	☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Site Review Form Calendar Year 2022
Ramblewood Park 37-119-0047

Parameters	Monitoring Objective	Scale	Monitor Type
Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☒ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☐ PM2.5 Cont. (BAM)	☐ General/Background_____ ☐ Highest Concentration_____ ☒ Population Exposure ☐ Source Oriented_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ Neighborhood ☐ Urban_____ ☐ Regional_____	☒ SLAMS _____ ☐ SPM_____ ☐ Nonregulatory_____ ☐ Supplemental Speciation _____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m_____
Actual measured distance from probe inlet to ground (meters) 2.1

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 2.1

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☐ (answer *'d questions) No ☐ NA ☒

* Distance between collocated PM 2.5 samplers within 1 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Give actual (meters):
Yes ☐ No ☐
Give actual (meters):

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☐ NA ☒

* Distance between collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 1 to 4 m of each other? Give actual (meters) _____ Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m)

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2022

Ramblewood Park 37-119-0047

COMMENTS:

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective: _____) No ☐

*3) Change scale of representativeness? Yes ☐ (enter new scale:) No ☐

*4) Relocate site? Yes ☐ No ☐

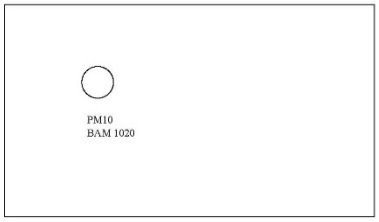
Date of Last Site Pictures: 03/14/22 New Pictures Submitted? Yes ☒ No ☐

Reviewer: Suzanne Holbrook Date: 03/29/22

Ambient Monitoring Coordinator: Danielle Jones Date: 5/16/2022

Ramblewood Park

37-119-0047



Site Review Form Calendar Year 2022
Friendship Park 37-119-0048

Region MCAQ	**Site Name** Friendship Park		**AQS Site** # 37-119-0048
Street Address 2310 Cindy Lane			**City** Charlotte
Urban Area CHARLOTTE		**Core-based Statistical Area**	Charlotte-Gastonia-Concord, NC-SC
Enter Exact			
Longitude W 80.851473	**Latitude** N 35.281791		**Method of Measuring**
In Decimal Degrees	In Decimal Degrees	Other (explain)	**Explanation**: Google Maps
Elevation Above/below Mean Sea Level (in meters)			224

Name of nearest road to inlet probe Cindy Lane AADT 7,500 Year latest available 2020

Distance of probe to nearest traffic lane (m) 200 Direction from inlet to nearest traffic lane N

Comments: _____

Name of nearest major road I-77 South AADT 86500 Year latest available 2020

Distance of site to nearest major road (m) 297 Direction from site to nearest major road ENE

Comments:

Site located near electrical substation/high voltage power lines?	Yes ☐	No ☒
Distance of site to nearest railroad track	(m)___Direction to RR ___	☒NA
Distance of site to nearest power pole w/transformer	(m) NA Direction	
Distance between site and drip line of water tower (m)	Direction from site to water tower	☒NA

Explain any sources of potential bias; include cultivated fields, loose bulk storage, stacks, vents, railroad tracks, construction activities, fast food restaurants, and swimming pools.

Site Review Form Calendar Year 2022
Friendship Park 37-119-0048

Parameters	Monitoring Objective	Scale	Monitor Type
Air flow < 200 L/min ☐ PM2.5 FRM ☐ PM10 FRM ☐ PM10 Cont. (BAM) ☐ PM10-2.5 FRM ☐ PM10-2.5 BAM ☒ PM2.5 Cont. (BAM)	☐ General/Background_____ ☐ Highest Concentration_____ ☒ Population Exposure ☐ Source Oriented_____ ☐ Transport_____ ☐ Welfare Related Impacts _____	☐ Micro_____ ☐ Middle_____ ☒ Neighborhood ☐ Urban_____ ☐ Regional_____	☒ SLAMS _____ ☐ SPM_____ ☐ Nonregulatory_____ ☐ Supplemental Speciation _____

Probe inlet height (from ground) ☐ < 2 m _____ ☒ 2-7m _____ ☐ 7-15 m _____ ☐ > 15 m_____
Actual measured distance from probe inlet to ground (meters) 2.1

Distance of outer edge of probe inlet from horizontal (wall) and/or vertical (platform or roof) supporting structure > 2 m?
Yes ☒ No ☐
Actual measured distance from outer edge of probe inlet to supporting structure (meters) 2.1

Are collocated PM2.5 Monitors (Two FRMs, FRM & BAM, BAM & BAM) Located at Site? *Yes ☐ (answer *'d questions) No ☐ NA ☒

* Distance between collocated PM 2.5 samplers (X) within 1 to 4 m of each other? Yes ☐ No ☐
*Are collocated PM2.5 sampler inlets within 1 m vertically of each other? Give actual (meters):
Yes ☐ No ☐
Give actual (meters):

Is a low-volume PM10 monitor collocated with a PM2.5 monitor at the site to measure PM10-2.5? *Yes ☐ (answer *'d questions) No ☐ NA ☒

* Distance between collocated PM10 and PM2.5samplers for PM10-2.5 (X) within 2 to 4 m of each other? Give actual (meters) _____ Yes ☐ No ☐
*Are collocated PM10 and PM2.5 sampler inlets within 1 m vertically of each other? Yes ☐ No ☐

Is probe > 20 m from the nearest tree drip line? Yes ☒ *No ☐ (answer *'d questions)

*Is probe > 10 m from the nearest tree drip line? Yes ☐ *No ☐
*Distance from probe to tree (m) _____ Direction from probe to tree ___ *Height of tree (m)

Are there any obstacles to air flow? *Yes ☐ (answer *'d questions) No ☒

*Identify obstacle _____ Distance from probe inlet (m) _____Direction from probe inlet to obstacle ___
*Is distance from inlet probe to obstacle at least twice the height that the obstacle protrudes above the probe? Yes ☐ No ☐

Site Review Form Calendar Year 2022
Friendship Park 37-119-0048

COMMENTS:

RECOMMENDATIONS:

1) Maintain current site status? Yes ☒ *No ☐ (answer *'d questions)

*2) Change monitoring objective? Yes ☐ (enter new objective: _____) No ☐

*3) Change scale of representativeness? Yes ☐ (enter new scale:) No ☐

*4) Relocate site? Yes ☐ No ☐

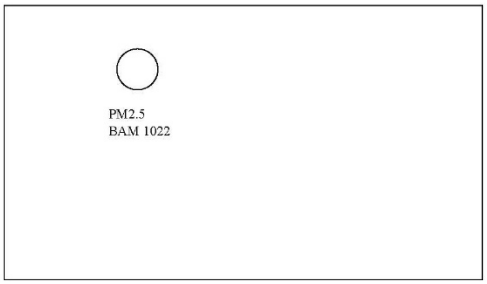
Date of Last Site Pictures: 03/14/22 New Pictures Submitted? Yes ☒ No ☐

Reviewer: Suzanne Hollander Date: 03/29/22

Ambient Monitoring Coordinator: Danielle Jones Date: 5/16/2022

Friendship Park

37-119-0048



IX. APPENDIX D

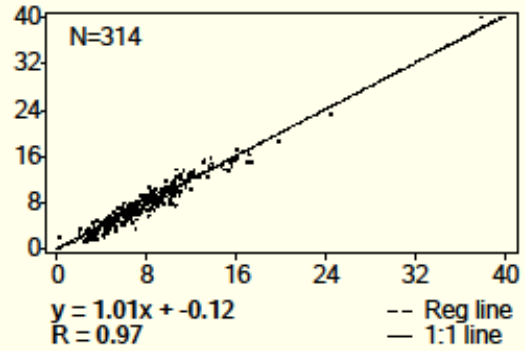
PM2.5 Continuous Monitor Comparability Assessment

$PM_{2.5}$ Continuous Monitor Comparability Assessment

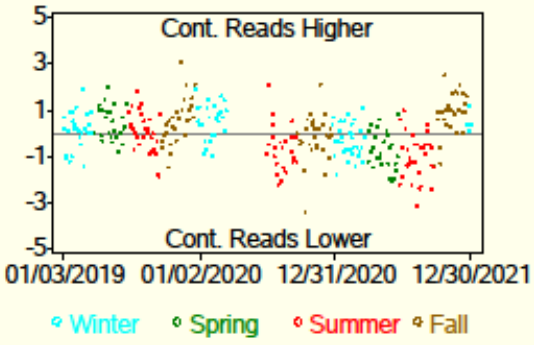
Site 37-119-0041: Charlotte, NC

FRM: R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC - Gravimetric (118,145), PM2.5 - Local Conditions (88101), POC=1
Cont: Met One BAM-1020 Mass Monitor w/VSCC - Beta Attenuation (170), PM2.5 - Local Conditions (88101), POC=3

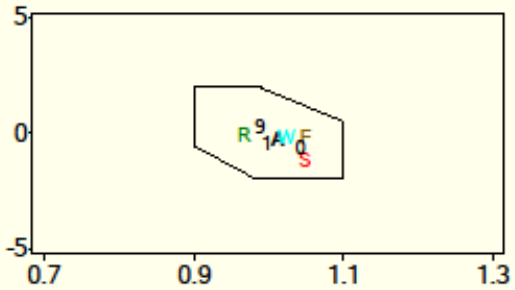
Cont. (y) vs. FRM (x) ($\mu g/m^3$)



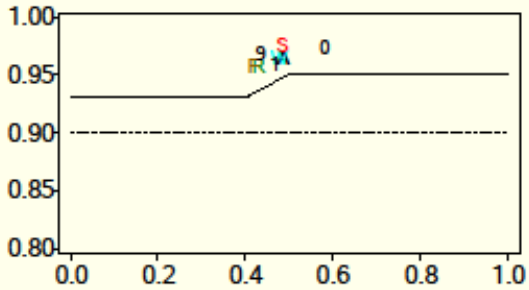
Cont. minus FRM ($\mu g/m^3$)



Additive (y) vs. Multiplicative (x) Bias



R (y) vs. FRM CCV (x)



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

Dataset	N	FRM	Cont	Ratio (Cont/FRM)
AllData	**314**	**8.0**	**7.9**	**1.00**
Winter	90	6.4	6.5	1.02
Spring	52	7.9	7.7	0.98
Summer	86	9.6	9.1	0.94
Fall	86	8.1	8.4	1.05
2019	115	8.1	8.4	1.04
2020	80	7.5	7.4	0.98
2021	119	8.1	7.9	0.96

Appendix A Statistics

Dataset	N (all observations)	Bias	N (only >= 3 ug/m^3)	Bias
AllData	**314**	**2.0**	**290**	**0.2**
Winter	90	10.7	74	4.1
Spring	52	-2.4	50	-1.6
Summer	86	-7.4	84	-6.5
Fall	86	5.1	82	4.5
2019	115	12.6	109	4.5
2020	80	-2.2	72	-1.9
2021	119	-5.3	109	-2.9

Data Source: EPA AQS Data Mart

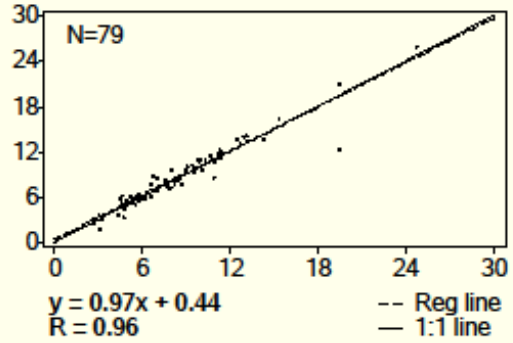
Generated: May 12, 2022

$PM_{2.5}$ Continuous Monitor Comparability Assessment

Site 37-119-0045: Charlotte, NC

FRM: R & P Model 2025 PM-2.5 Sequential Air Sampler w/VSCC - Gravimetric (145), PM2.5 - Local Conditions (88101), POC=1
Cont: Met One BAM-1022 Mass Monitor w/ VSCC or TE-PM2.5C - Beta Attenuation (209), PM2.5 - Local Conditions (88101), POC=3

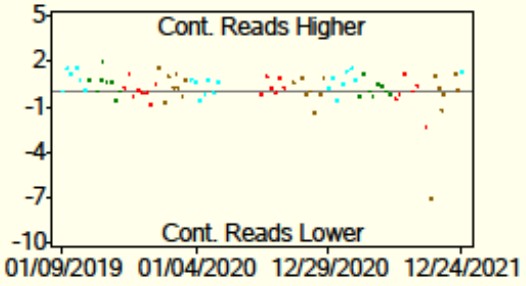
Cont. (y) vs. FRM (x) ($\mu g/m^3$)



y = 0.97x + 0.44
R = 0.96

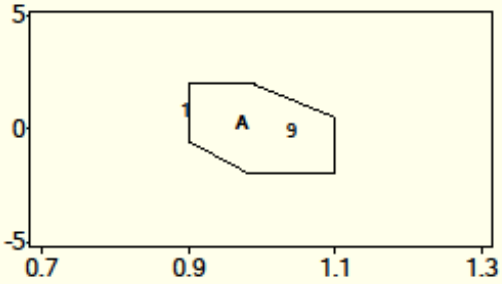
-- Reg line
— 1:1 line

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



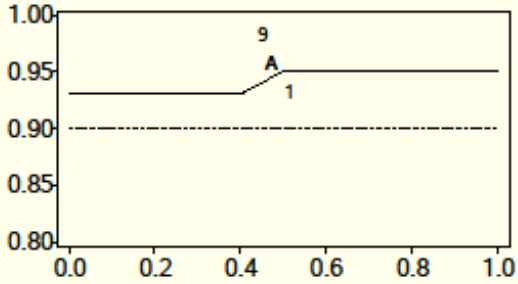
Winter Spring Summer Fall

Additive (y) vs. Multiplicative (x) Bias



A=AllData, 9=2019, 0=2020, 1=2021
W=Winter, R=Spring, S=Summer, F=Fall

R (y) vs. FRM CCV (x)



A=AllData, 9=2019, 0=2020, 1=2021
W=Winter, R=Spring, S=Summer, F=Fall

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

Dataset	N	FRM	Cont	Ratio (Cont/FRM)
AllData	**79**	**8.4**	**8.6**	**1.03**
Winter	21	7.2	7.8	1.08
Spring	16	7.8	8.1	1.04
Summer	20	10.0	10.1	1.01
Fall	22	8.5	8.4	0.99
2019	31	8.6	9.1	1.05
2020	20	7.2	7.4	1.03
2021	28	8.9	8.9	1.00

Appendix A Statistics

Dataset	N (all observations)	Bias	N (only >= 3 ug/m^3)	Bias
AllData	**79**	**3.3**	**76**	**3.6**
Winter	21	9.7	19	9.5
Spring	16	4.8	16	4.8
Summer	20	0.2	20	0.2
Fall	22	-1.2	21	0.6
2019	31	5.9	30	6.1
2020	20	2.3	19	1.2
2021	28	1.1	27	2.5

Data Source: EPA AQS Data Mart

Generated: May 12, 2022

X. APPENDIX E

PAMS Parameter Codes - Auto-GC-FID Speciated VOCs

PAMS parameter list: The method code for the Agilent Auto-GC-FID systems is 228, unit code 078 and interval 1.

Parameter Code	Parameter Name
43202	Ethane
43203	Ethylene
43204	Propane
43205	Propylene
43214	Isobutane
43212	n-Butane
43206	Acetylene
43216	trans-2-Butene
43280	1-Butene
43217	cis-2-Butene
43242	Cyclopentane
43221	Isopentane
43220	n-Pentane
43218	1,3-Butadiene
43226	trans-2-Pentene
43224	1-Pentene
43227	cis-2-Pentene
43244	2,2-Dimethlybutane
43284	2,3-Dimethlybutane
43285	2-Methlypentane
43230	3-Methlypentane
43243	Isoprene
43245	1-Hexene
43231	n-Hexane
43262	Methylcyclopentane
43247	2,4-Dimethlypentane
45201	Benzene
43248	Cyclohexane
43263	2-Methlyhexane
43291	2,3-Dimethylpentane
43249	3-Methlyhexane
43250	2,2,4-Trimethlypentane
43232	n-Heptane
43261	Methylcyclohexane
43252	2,3,4-Trimethlypentane
45202	Toluene
43960	2-Methlyheptane
43253	3-Methlyheptane
43233	n-Octane
45203	Ethylbenzene
45109	m/p-Xylene

45220	Styrene
45204	o-Xylene
43235	n-Nonane
45210	Isopropylbenzene
43256	α-pinene
45209	n-Propylbenzene
45212	m-ethyltoluene
45213	p-Ethyltoluene
45207	1,3,5-Trimethlybenzene
45211	o-Ethyltoluene
43257	β-pinene
45208	1,2,4-Trimethlybenzene
43238	n-Decane
45225	1,2,3-Trimethlybenzene
45218	m-Diethylbenzene
45219	p-Diethylbenzene
43954	n-Undecane
43141	n-Dodecane
43102	TNMHC
43000	TNMTC

XI. APPENDIX F

Responses Public Comments on Annual Network Plan

On May 23, 2022, the “2022-2023 Annual Monitoring Network Plan - MCAQ” was released for public comment during a meeting of the Mecklenburg County Air Quality Commission (AQC). The public comment period was open from May 23, 2022, through June 22, 2022.

Summary of Public Comment Period
No comments were received during the public comment period.

Comment: N/A

MCAQ Response: N/A