



CHATTANOOGA- HAMILTON COUNTY AIR POLLUTION CONTROL NETWORK REVIEW 2020

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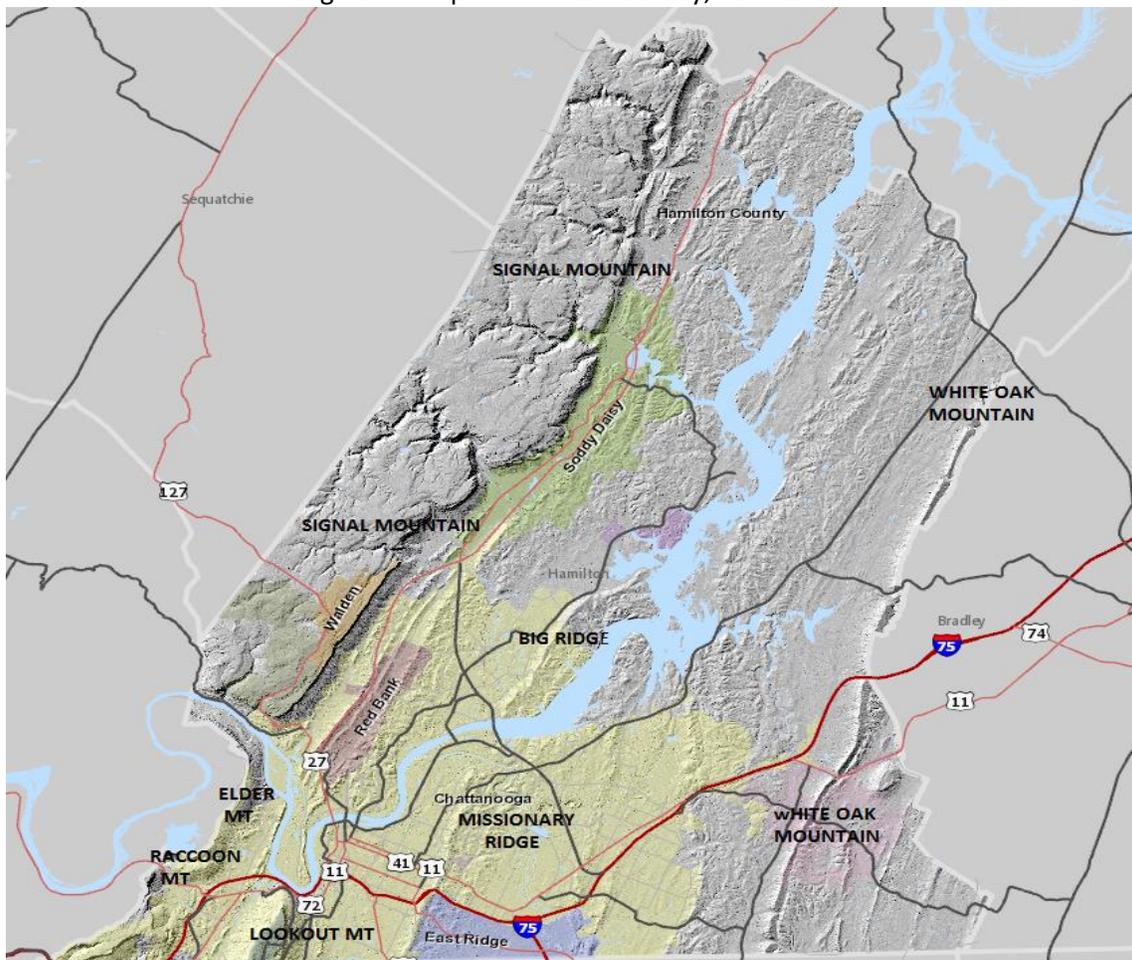
Introduction

Hamilton County, Tennessee, contains the City of Chattanooga and the municipalities of Soddy Daisy; Signal Mountain; Red Bank; East Ridge; Collegedale; Ridgeside; Walden; Lakesite; and Lookout Mountain, Tennessee, and the remaining unincorporated area of Hamilton County. It is on the Tennessee, Georgia, Alabama border which means that pollution reduction is a cooperative effort between states. Designation areas for both ozone and particulate contain counties from Tennessee and Georgia.

Geography

Hamilton County is a picturesque Tennessee River valley between White Oak Mountain on the east of the county and Mowbray, Signal, Elder, Raccoon, and Lookout Mountains on the West of the County. The county is divided vertically by Big Ridge and Missionary Ridge, part of the same ridge chain. The Tennessee River flows through the ridge horizontally (where the ridge name changes) and through downtown Chattanooga. The valley, therefore, is shaped similarly to an "A". The topography is a liability for pollution prevention and reduction as frequent temperature inversions trap smoke in the valley.

Figure 1- Map of Hamilton County, Tennessee



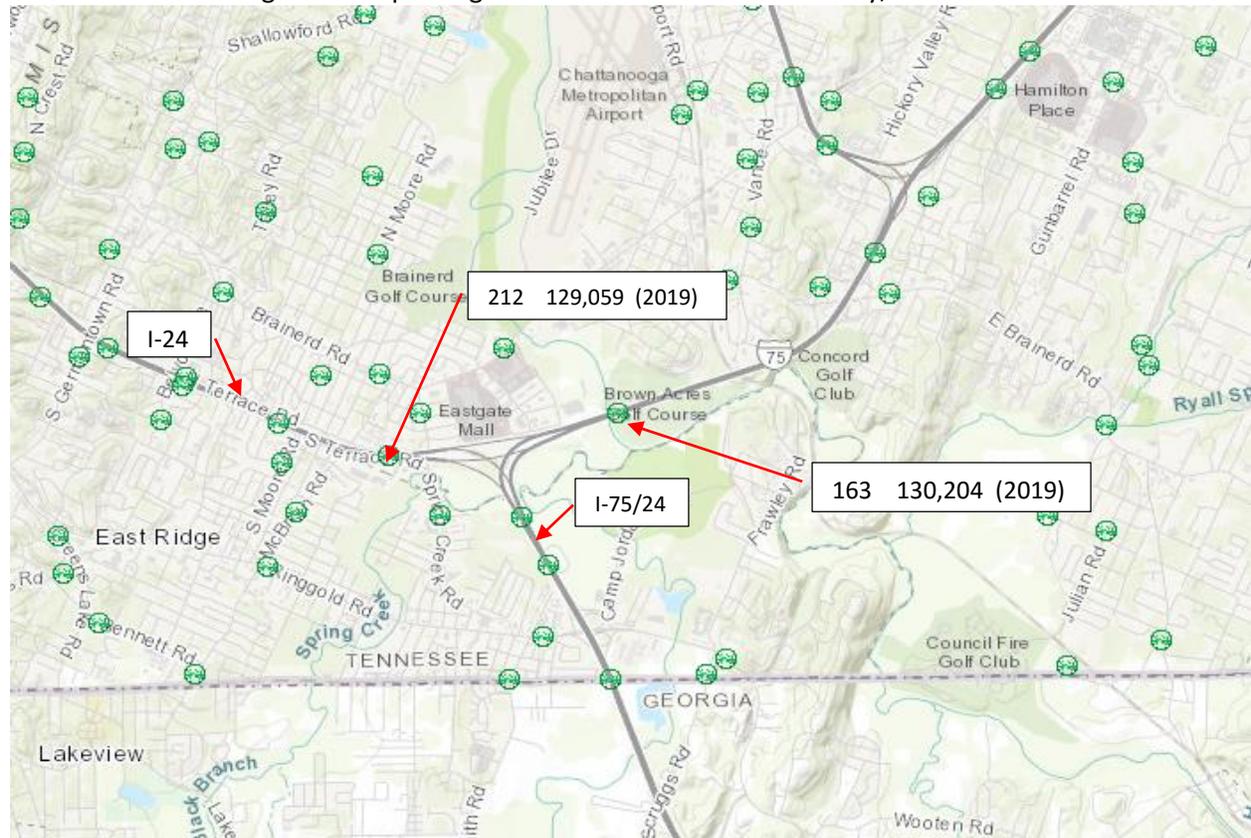
Downtown Chattanooga is about 680 feet above sea level. There were at least four floods of downtown Chattanooga in the late 1800s and early 1900s, the most devastating one in 1867. To attempt to remedy the flooding, downtown was filled in from 3 to 15 feet after 1917 or an average of about one story. The fill area started with four central downtown streets and eventually covered about 40 blocks. Begun in 1933, the Tennessee Valley Authority's system of dams and control of the waterways not only provided electricity to the masses, but it improved Chattanooga's flooding plight considerably.

Traffic Patterns

About 1988 the then largest mall in Tennessee, Hamilton Place, was built in East Brainerd accessible by I-75. This spurred commercial and residential growth around the mall. In one year vehicle miles traveled (VMT) per year increased from about 6 million VMT to over 10 million VMT. It has stayed in the 9.7 to 10.95 million range since. There has, however, been a steady increase since 2013.

The Interstate 75 corridor, a major north-south route for commercial transport, runs through Chattanooga and connects with I-24 near East Ridge. On either side of the I-75/I-24 split are the highest traffic counts in Hamilton County. The latest available posted numbers are 2019 indicating a daily average traffic count of 129,059 at #212 East Ridge Station which is just west of the I-75/I-24 split. The highest count in Hamilton County is on the east side of the split at #163 is 130,204. The major rework of the I-75/24 split by the state began in 2020. This project is designed to ease some of the traffic congestion as the split is a traffic bottleneck. Vehicle pollution in that area is expected to be reduced when the project is completed. The congestion will be problematic during the construction.

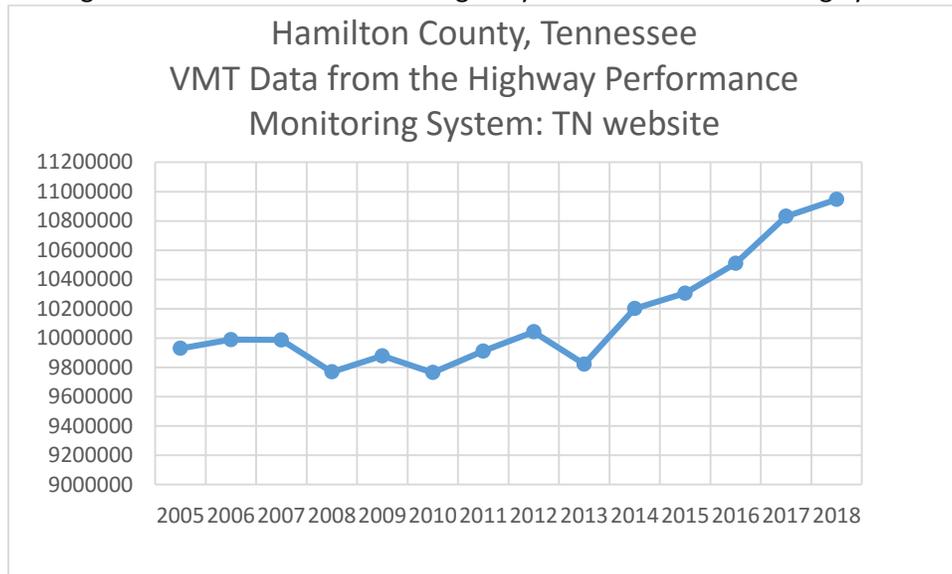
Figure 2- Map of High Traffic Area of Hamilton County, Tennessee



Vehicle Miles Traveled

The latest available data posted on TDOT's website for VMT by county is 2018. The VMT has been increasing steadily since 2013.

Figure 3- Data from Tennessee Highway Performance Monitoring System



The year 2020 should decrease in VMT due to the shelter in place policy because of the Covid- 19 pandemic. Vehicle insurance companies rebated money to their customers because of the reduction in accidents during this time period. The reduction in traffic should make a significant contribution toward lowering ozone and particulate pollution for Hamilton County for 2020.

Population

The U.S. Census Bureau population estimate (from the website) for July 1, 2019, for Hamilton County is 367,804 and for 2018 (2019 not available) for the City of Chattanooga is 180,557.

The two areas of the highest population density in Hamilton County are in the municipality of East Ridge and downtown in the University of Tennessee at Chattanooga area. Both areas of the highest density contain particulate monitoring sites for PM_{2.5}. The University density is seasonal as the density decreases in the summer months. The population density of East Ridge is 2,534 persons per square mile (2010 census) whereas the City of Chattanooga has a population density of 1,223 (2010) persons per square mile. East Ridge, therefore, is more than twice as dense as the City of Chattanooga. The population density of Hamilton County is 620 (2010) persons per square mile.

The Hamilton County racial demographics for predominant ethnicities for 2018 (most current available from US Census Bureau) of Hamilton County (based on the Vintage 2018 Population Estimates Program) are White only (not Hispanic or Latino) 71.0%; Black only 19.4%; Asian only 2.1%; and Latino/Hispanic only 5.9%. The racial demographics of the City of Chattanooga (based on the 2018 American Community Survey- 5 year estimates) for predominant ethnicities are: White only (not Hispanic or Latino) 56.6%, Black only 32.6%, Asian only 2.4%, and Latino/Hispanic only 6.1%. The Census Bureau cautions against

comparisons of geographic area racial demographics because of the methodology differences in data sources.

The 2018 Small Area Income and Poverty Estimates (SAIPE) on the US Census Bureau website estimates the poverty in Hamilton County for 2018 as 13.0%. The poverty estimate for the City of Chattanooga is 18.8% based on the 2018 American Community Survey 5-year estimates. Neither estimation of poverty is comparable to other geographic level poverty estimates because of the methodology differences in data sources.

The Covid-19 pandemic in 2020 increased unemployment and poverty in both the City of Chattanooga and Hamilton County. Large industrial employers, retail stores, restaurants, and nail/hair salons were forced to shut down for the pandemic shelter in place. The temporary or permanent loss of employment affected the most vulnerable populations.

The Chattanooga-Hamilton County CBSA is composed of Hamilton, Marion, and Sequatchie counties in Tennessee and Catoosa, Dade, and Walker Counties in Georgia. The US Census Bureau’s 2019 population estimate for the CBSA is 565,194 with an estimated increase of 4,401 over the estimate for 2018. Hamilton County is the most urbanized county in the CBSA. The other counties are more rural.

Weather

Hamilton County tends to have frequent temperature inversions.

Figure 4- Thirty Year Averages
National Weather Service website
(‘Normals’ are thirty year averages based on the period 1981-2010)

Chattanooga Annual Averages	
Precipitation.....52.48 inches	Days with 0.01" or more of precipitation.....119.6
Snowfall.....3.9 inches	Days with 1.0" or more of snowfall.....1
Days with thunderstorms.....54.8	Days at or above 90 F.....47.7
Days with dense fog.....27.3	Days at or below 32 F.....58.3
Average first freeze.....November 4	Average last freeze.....April 1
Average first frost.....October 20	Average last frost.....April 14

Wind speed and direction are of interest in evaluating pollution, emissions, and transport. These wind roses were produced from data collected at the Chattanooga Metropolitan Airport at Lovell Field (Station 13882) using the Midwestern Regional Climate Center’s Application Tools Environment.

Figure 5- Ten Year Wind Rose for Jan 1, 2010- December 31, 2019

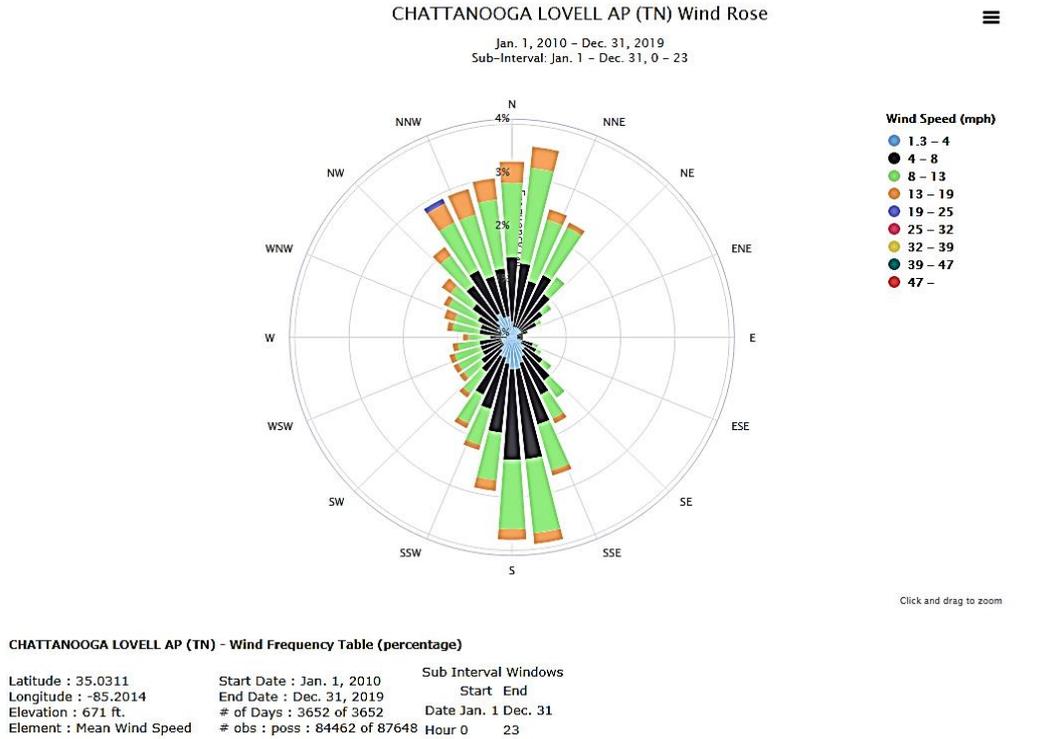
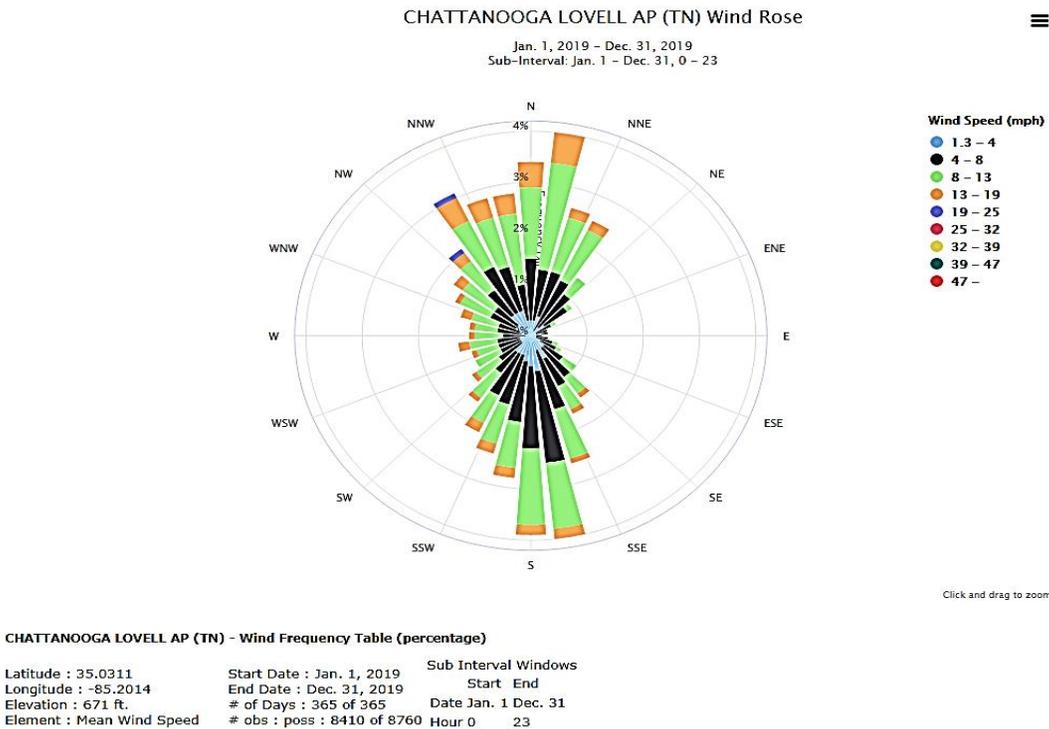


Figure 6- Wind Rose for 2019



Tornados

On Easter Sunday, April 11, 2020, seven tornados devastated areas of Hamilton County and counties nearby. Three tornados, beginning about 8:15 PM EDT, individually touched down in Walker County, Murray County, and Dade County in Georgia. Then a tornado touched down in Hamilton County. As the Hamilton County storm moved toward Bradley County, Tennessee, three more tornados developed in Bradley County.

According to the National Weather Service release published in the *Times Free Press* on April 18, 2020, the EF3 tornado that devastated Hamilton County was 1,500 yards wide and 14.5 miles long. The tornado traveled from southeast Chattanooga to Ooltewah. More than 1,000 buildings were damaged causing millions of dollars in destruction. A subdivision, Holly Hills, in East Brainerd was particularly devastated, and most of the 200 homes were damaged or destroyed.

The Bureau issued “tornado damage” burn permits to extend outdoor burning to June 15 with the special permit. Normally burn season ends April 30. The sites are inspected by the Bureau’s Inspector before the permit is issued. The City of Chattanooga is picking up brush where it can be moved to the road.

The residential neighborhood that was hardest hit, Holly Hills, is within 5 miles of the Bureau Eastside Utility ozone site. The Bureau will be monitoring the outdoor burning in relation to pollution levels. Although it is not anticipated that the burning will significantly affect pollution data because pollution levels have been quite low for several years, the Bureau has been in contact with EPA Region 4 in Atlanta about the tornado disaster event. The Bureau will apply for exceptional event status, if needed.

Network Review 2020

PM₁₀ Site Requirement Waiver

The Chattanooga-Hamilton County Air Pollution Control Bureau (the Bureau) petitioned EPA on August 28, 2014, to delete the collocated PM₁₀ site operating on a 6-day monitoring schedule at 3300 South Broad Street (470650006). High volume samplers were operated at the site. EPA approved the site deletion in the approval letter for the 2014 State Air Monitoring Plan dated January 13, 2015. The monitors were shut down after the January 12, 2015, run date. EPA considers the deletion of this site the granting of a waiver of 40 CFR requirements.

Data Comparison to the NAAQS

40 CFR Part 58 requires the Annual Monitoring Network Review to identify sites that are suitable and sites that are not suitable for comparison against the annual PM_{2.5} NAAQS. All four Chattanooga-Hamilton County monitoring sites produce data that are suitable to compare against the National Ambient Air Quality Standards. All sites meet siting requirements, and all required data are produced by Federal Equivalent or Federal Reference Methods. All sites' data meet data completion requirements and quality control requirements. Ozone and PM_{2.5} particulate data are meeting the NAAQS.

Purchase of T640 for PM_{2.5} AQI

The Bureau purchased a Teledyne T640 light scattering instrument in 2016 for continuous PM_{2.5} monitoring. It began operation in 2017 as a Special Purpose Monitor for PM_{2.5} until January 1, 2019, then it was made a SLAMS (retaining the POC 3). It monitors PM₁₀ data in addition to PM_{2.5}, but the PM₁₀ data is not Federal Equivalent. The 1400 AB TEOM has been decommissioned. It was removed from the site when the shelter was removed.

Figure 7- Active Sites

Chattanooga-Hamilton County Active Sites	Pollutant	Monitor	AQS #
911 Siskin Drive	PM _{2.5} Collocated (Primary-3-day, Secondary 12-day): TEI R & P FRM filter-based/ PM _{2.5} Continuous (FEM) and PM ₁₀ (not FEM): T640	(2) TEI R & P 2025i Seq. Teledyne T640 Continuous	470654002 CORE PM _{2.5}
1517 Tombras Avenue Behind East Ridge City Hall	PM _{2.5} (Daily collocation from 1/1/2009-1/17/2010) 3-day monitoring began 1/20/2010)	TEI R & P 2025 Seq.	470650031
618 Sequoyah Road Soddy-Daisy H.S.	Ozone Continuous Ozone Calibrator	TECO 49i (49C in use for 2020) TECO 49iPS	470651011
3018 Hickory Valley Road Eastside Utility District	Ozone Continuous Ozone Calibrator	TECO 49i TECO 49iPS	470654003

Figure 8- Equipment Evaluation 2020

Equipment	Location	Serial Number	Condition
PM ₁₀ -Stored	0006	1847- decommissioned 1/2015	Good
PM ₁₀ -Stored	0006	1845-decommissioned 1/2015	Good
PM _{2.5}	4002	20781 with VSCC	Parts only
PM _{2.5}	4002	20775 with VSCC	Good
PM _{2.5}	0031	20772 with VSCC	Good
PM _{2.5}	Spare	20774-decommissioned 12/31/2015	Good
PM _{2.5}	Spare	90709	Good
PM _{2.5} TEOM	Spare	1400A 24452: Eq Unit SES1B 203940211 Sensor Unit 140AB 244520302	Good
PM _{2.5} T640	4002	070600000:83	Excellent
Met One Speciation	4002	a5924/a5910-decommissioned 1/2015	Good
URG 3000	4002	3N-B0768- decommissioned 1/2015	Good
Ozone	1011	49i-143566748-installed 2/2015	Excellent
Ozone	4003	49i-143566747-installed 2/2015	Excellent
Ozone-Spare	1011	49C-58192-316	Good
Ozone-Spare	4003	49C-57404-313	Good
Ozone Calibrator-Spare	1011	49CPS-66337-352	Good
Ozone Calibrator-Spare	4003	49CPS-66338-352	Good
Ozone Calibrator	1011	49iPS- installed 2/2016	Excellent
Ozone Calibrator	4003	49iPS- installed 2/2016	Excellent
Data logger	1011	ESC 8816-1904	Good
Data logger	4003	ESC 8816-1905	Good
Data logger	Spare	ESC 8816-1906	Parts only
Data logger	4002	ESC 8832 AO994	Good
Data logger	1011	ESC 8832 A 4010 K	Good
Data logger	4003	ESC/Agilaire 8872 installed Aug 2017- 642	Excellent
Data logger	1011	ESC/Agilaire 8872: new April 2018: Installed in 2018, removed, and reinstalled for March 1, 2019- 799	Excellent
Ozone Audit Monitor	1011/4003	49i-0607415796	Good
Chart Recorder	1011	1001685- decommissioned 2/2017	Good
Chart Recorder	4003	1001686- decommissioned 2/2017	Good
Chart Recorder	Spare	Leeds/Northrup Speedomax 165 82-31986-1-1	Good
8 X 14 Shelter	1011	Shelter One 8148 SN21051-to be replaced	Good
8 X 14 Shelter	4003	EKTO 8814 SN 3473-1- to be replaced in 2020	Poor
PC with AV Trends	1011	Agilaire software/companion to Airvision	Excellent
PC with AV Trends	4003	Agilaire software/companion to Airvision	Excellent
UPS	1011	8872 needed UPS -installed 2018	Excellent
UPS	4003	8872 needed UPS-installed 2018	Excellent
Siskin Site deck	4002	Installed June 2018	Excellent

Changes to Established Sites

The Siskin Drive shelter at the 470654002 (downtown) site was removed because of its poor condition and was replaced with a platform in June of 2018. When the equipment was removed from the shelter to install on the deck, the TEOM was taken out of service. The new Teledyne T640 continuous PM_{2.5} monitor reports to AirNow for the Air Quality Index in place of the TEOM. The minishelter to the right in the photograph houses the T640. Behind the minishelter is a cabinet that houses the data logger.

Figure 9- New Deck for PM_{2.5} at 911 Siskin Drive.



The Bureau ordered a new shelter for the Eastside Utility site that is expected to be delivered in late summer 2020. The installation is currently anticipated to be completed between November 1, 2020, and February 1, 2021, during the period monitoring is not required. A second new shelter is to be ordered after July 1, 2020, for the Soddy Daisy Site. The anticipated installation is expected to be between November 1, 2020, and February 1, 2021.

The chart recorders at the ozone sites have been taken out of service entirely. In their place is an additional data logger at each site, spare Agilaire 8816s. Both the primary and secondary loggers are being polled. Both sites also have AV Trends software that captures data from the primary logger on a local PC. AV Trends enables the operator to view previously recorded data during a site visit. Data at the site can be manipulated into graphs using the software.

AV Trends is not currently being used at the two ozone sites for ozone season 2020. The City of Chattanooga has transitioned to Windows 10. The newest version of AV Trends is apparently not compatible with Windows 7 that is on the AV Trends computers. New computers with Windows 10 have been ordered for AV Trends.

The Bureau began using Very Sharp Cut Cyclones (VSCCs) for all PM_{2.5} FRMs on January 1, 2017. The Bureau is no longer using WINs Impactors.

Temporary Measure for Ozone Monitoring at Soddy Daisy Site

A flow sensor was ordered for the TEI 49i analyzer that is normally installed at the Soddy Daisy ozone site. The 2020 ozone season was started with a 49C instrument at Soddy Daisy that had been stored. The flow sensor order was delayed and has just now arrived at the Bureau (April 2020). The current plan is to leave the 49C in place for this ozone season.

Collocation Requirements

Hamilton County's collocation requirement is met by having two FRM PM_{2.5} monitors at the Siskin Drive site. The collocated FRM began operating on a 12-day schedule on May 9, 2019.

No Expected Site Changes for 2020

No appropriate nearby sites have been found to move the Eastside Utility site. Since the site is close to a fairly high crime area the added security from Eastside Utility has become more attractive.

Memorandum of Agreement with the State of Georgia

The Memorandum of Agreement with the State of Georgia was renewed in 2018. A copy is included in Appendix A.

SODDY DAISY HIGH SCHOOL



Rep Org Name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU	<p>The Soddy Daisy High School site is located in the municipality of Soddy-Daisy in North Hamilton County. The site was initially established as an ozone site August 1, 1978, at 9527 West Ridge Trail Road behind the Head Start Building using a chemiluminescence method. June 1, 1979, the method was changed to UV. The ozone site was moved February 1, 2002, within a mile radius, to a new shelter on a hill behind Soddy Daisy High School. The PM_{2.5} monitor was originally located on the roof of the Sheriff's Annex at 6233 Dayton Boulevard (AQS 470650032) as a Special Purpose Monitor (established 6/5/1999). The monitor was moved to the roof of the new shelter at 470651011 in mid-January 2002- first monitoring date was 1/26/02. In June 2008 the monitor was changed from a WINS Impactor to a Very Sharp Cut Cyclone model while retaining the same method code to designate it FRM. May 20, 2009, the shelter and monitors were moved approximately 100 feet east on the same property to accommodate the building of a girls' softball field. The Bureau shut down the PM_{2.5} SPM at the end of December 2015. The last run date was 12/27/2015. The site is active for ozone monitoring.</p>
PQAO	0170	
Address	SODDY DAISY HIGH SCHOOL 618 SEQUOYAH ACCESS ROAD	
AQS ID	470651011	
County Name	HAMILTON	
CBSA	CHATTANOOGA/ NORTH GEORGIA	
Lat	35.233562	
Lon	-85.181591	
Parameter Code	44201	
Parameter	OZONE	
Monitor Type	SLAMS	
POC	1	
Interval	1	
Year	2020	
Collection Freq.	HOURLY	
Method	047	
FRM/FEM	THERMO ENVIRON. 49i	
Analysis	UV PHOTOMETRIC	
Ref Mtd ID	EQOA-0880-047	
Monitor Type	047	
Monitor Object.	BACKGROUND	
Dominant Source	AREA	
Meas. Scale	NEIGHBORHOOD	
Land Use Type	COMMERCIAL	
Location Setting	RURAL	
Elevation	930 FT ABOVE SEA LEVEL	
Closest Meteorological Site	CHATTANOOGA METROPOLITAN AIRPORT 1001 AIRPORT RD	
Date Site Established	8/01/1978 MOVED TO SDHS 2/1/2002, PM _{2.5} DELETED 12/31/15	

Site Evaluation 2020

Soddy Daisy High School, 618 Sequoyah Road 470651011		
Street Name	Average Daily Traffic Counts: TDOT website	Distance
Sequoyah Road- in front of the school	9,238 2019 (Station #374)	.28 miles, 446 meters
Hyatte Road- behind the site	2,129 (Lovell Road- intersects with Hyatte Rd) 2019 (#306)	.02 mile, 39.74 meters

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	School property- boys ball fields
South	Beyond Hyatte Road is residential, rural, agricultural
East	Soddy Daisy High School and Daisy Elementary, 620 Sequoyah Road
West	Girls softball field, beyond the field is Hyatte Road, beyond Hyatte Road is residential, rural, agricultural

Directions	Trees	Height (m)	Distance (m)
North	tree, tree	7.0 m, 10.8 m	26.0 m, 44.3 m
South	Tree Row	15 m	30.0 m
East	Tree Row	12.6 m	75.3m
West	Field House	2 story	74.2 m

Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Site is on hill	hill
South	Residential, farms	
East	Student parking lot below site	
West	Two story field house/concessions, parking lot and girls ball field on hill above site	Site is between an upper parking lot and a lower parking lot

Intake Height	
Soddy Daisy ozone	5.2 m

Soddy Daisy High School 470651011
North



Northeast



Soddy Daisy High School-470651011

East



Southeast



Soddy Daisy High School- 470651011
South



Southwest



Soddy Daisy High School 470651011
West



Northwest



EASTSIDE UTILITY



Rep Org Name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU	<p>This ozone site was originally established June 13, 1979, using a UV method on Volunteer Army Ammunition Plant (VAAP) property as site 470650028. According to notes in AQS, the ozone monitor was moved to the Laboratory Building on Patrol Road from 100-200 feet away about 1979. About 1982 the ozone monitor was moved to a trailer across the street and northwest of the lab in a wooded area. It was moved to Eastside Water Utility on the top of a hill in February, 2004, because of a road widening project which utilized the property on which the monitoring module sat. The site was moved more than two (2) miles which required changing the AQS identifying number from 470650028 to a new number, 470654003. The site is inside the Eastside Water Utility high security area.</p>
PQAO	0170	
Address	RESERVOIR RD (PRIVATE DRIVE), UTILITY OFFICE ADDRESS: 3018 HICKORY VALLEY ROAD	
AQSID	470654003, FORMERLY 0028	
County name	HAMILTON COUNTY	
CBSA	CHATTANOOGA/ NORTH GA	
Lat	35.102862	
Lon	-85.162243	
Parameter Code	44201	
Parameter	OZONE	
Monitor Type	SLAMS	
POC	1	
Int	1	
Year	2020	
Collection Freq	HOURLY	
Method	047	
FRM/FEM	THERMO ENVIRON. 49i	
Analysis	UV PHOTOMETRIC	
Ref Mtd ID	EQOA-0880-047	
Monitor Objective	TYPICAL CONCENTRATIONS	
Dominant Source	AREA	
Meas. Scale	URBAN	
Land Use Type	INDUSTRIAL	
Location Setting	URBAN AND CENTER CITY	
Elevation	940 FT ABOVE SEA LEVEL	
Closest Met Site	CHATTANOOGA METRO-POLITAN AIRPORT, 1001 AIRPORT ROAD	
Date Site Established	6/13/1979 Moved from 0028- 2/2004 for 3/1/2004 season	

Site Evaluation 2020

3018 Hickory Valley Road, Eastside Utility 470654003	
Street Name	Traffic Counts: Average Per Day TDOT webpage
Highway 58	31,255 2019 (Station #271)
Hickory Valley Road	10,546 2019 (#613)
Reservoir Road – private drive to Eastside Water Utility	3 or 4 vehicles a day and a few trucks as the county is dumping dirt in a hole on the hill
Interstate 75	74,354 2019 (#616)
Highway 153	73,233 2019 (#216) ; 73,050 2019 (#265)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	Commercial along Highway 58, residential beyond Highway 58
South	Undeveloped forest and Commercial/Industrial area
East	Forest
West	Forest to Highway 58, Commercial on Highway 58, then residential beyond

Directions	Trees/Buildings	Height (m)	Distance (m)
North	None		
South	Building- One story	1 story: 3.7 m	12.6 m
East	None		
West	SW- Building Tree behind building	2 story: top of gable: 7.3 m 14.5	20.7 m 30.4 m

Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Site is on top of a hill at about 900 feet. It is a wilderness area as the entire hill is a gated high-security area. A drive to the site is through a beautiful forest and past a lake. One encounters deer, wild turkeys, hawks, and buzzards. Site is on the north edge of the hill- almost hanging over Highway 58. To the north is looking down the hill.	6,372 acres were a TNT production plant (closed in mid 70s) controlled by the military that once housed nitric acid and sulfuric acid plants. About 1,000 acres are developed to the southeast of this monitoring site as a commercial/ industrial area around and including the Volkswagen Plant. The Highway 58 area at the bottom of the hill to the North is commercial. Highway 58 is a major highway running east/west.
South	One story building- Commercial	Flat on top of hill
East	Looking downhill	
West	Looking downhill	

Intake Height	
Eastside ozone	4.2 m

Eastside Utility -470654003
North



Northeast



Eastside Utility -470654003
East



Southeast



South, Southwest, and West cardinal directional pictures have been removed for security reasons. They have been supplied to EPA.

Northwest



SISKIN DRIVE/ UT Chattanooga



Rep Name	CHATTANOOGA-HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU		
PQAO	0170		
Address	911 SISKIN DRIVE		
AQSID	470654002		
County	HAMILTON		
CBSA	CHATTANOOGA/ NORTH GEORGIA		
Lat	35.050918		
Lon	-85.293019		
Parameter	88101	88101	88101
Parameter	PM _{2.5}	PM _{2.5}	PM _{2.5} CONTINUOUS
Monitor	SLAMS	SLAMS	SLAMS
POC	1	2	3
Interval	7	7	1
Year	2020	2020	2020
Collection Freq.	3-DAY	12-day beginning 5/9	HOURLY
Method	145 VSCC	145 VSCC	236
FRM/FEM	R & P 2025 SEQ	R & P 2025 SEQ	T640 REG MODEL
Analysis	GRAVIMETRIC LAB: IML	GRAVIMETRIC LAB: IML	LIGHT SCATTERING
Ref Mtd ID	RFPS-0202-145	RFPS-0202-145	EQPM 0516-236 2.5 only
Objective	POPULATION		
Dom. Source	AREA		
Meas. Scale	URBAN		
Land Use	COMMERCIAL		
Location	URBAN/ CENTER CITY		
Elevation	720 FT ABOVE SEA LEVEL		
Closest Met	CHATTANOOGA METROPOLITAN AIRPORT, 1001 AIRPORT RD		
Date Estab.	1/01/1999	1/01/1999	2/15/2017

The Siskin Drive site was initially established January 1, 1999, as a CORE PM_{2.5} site with collocated FRM monitors on the roof of the Davenport Building, 529 Oak Street, on the University of Tennessee at Chattanooga campus. The monitors were moved to the Student Center roof, 650 East 5TH Street, about early 2000; moved to a temporary site behind the University Administration Building at 400 Palmetto Street in late 2003 where the TEOM was first installed; then to a new shelter at the current site March 15, 2004, at 911 Siskin Drive. Met One Speciation was added 12/1/2001; a continuous PM_{2.5} monitor was added 3/26/2004; and a URG3000 was added 10/1/2009. The continuous PM_{2.5} monitor (TEOM) was operated at 30°C and had an SES predryer. The predryer failed in 2013 and was removed. The temperature was then raised to 50°C. A different early model TEOM was used. EPA defunded the Met One speciation and the URG3000 monitors in January 2015, and speciation monitoring ceased. FRMs were converted from WINS to VSCC models January 1, 2017. A T640 continuous was added in January, 2017, as an SPM. It began reporting PM_{2.5} to AQS February 15, 2017. The shelter was replaced with a deck in June of 2018. At that time the TEOM was taken out of service and the T640 began reporting to AirNow. Beginning January 1, 2019, the T640 status was changed from SPM to SLAMS. The FRM POCs 1 and 2 and T640 data are now combined to compare against the standard. The data from whatever monitors are running each day are averaged for that day. The T640 retains POC 3. The POC 2 FRM changed from 3-day to 12-day monitoring on 5/9/19.

Site Evaluation 2020

911 Siskin Drive 470654002 (Former site on University of Tennessee at Chattanooga campus)

Street Names	Average Daily Traffic Counts: TDOT website
Siskin Drive	No counts: side road behind school
Third Street	17,136 2019 (Station #107)
Riverside Drive/Amnicola Highway	29,191 2019 (#108)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	Commercial –Power Utility Fenced Enclosure for large transformers
South	School baseball field- Erlanger Hospital and Health Department in background
East	Siskin Rehabilitation Facility
West	Commercial-Power Utility Fenced Enclosure. Beyond Siskin Drive to the south are parking lots and buildings for school, Chattanooga School for Arts and Sciences, K-12. The school, parking lots, and athletic fields occupy the entire block bordered by Siskin Drive, Third Street, and Siskin Rehabilitation Facility

Directions	Trees/Buildings	Height (m)	Distance (m) from Siskin1	Distance (m) From Siskin 2	Distance (m) from T640
North	NE-Tree line	6.0	34.8	36.4	34.8
	NW-Tree in Utility Enclosure	6.4	32.28	33.2	31.2
South					
East					
West					

Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Site is on a small rise NE	Hill rises to north
South	School facilities	Hill
East	Two story building- Rehabilitation Facility	Hill
West	Transformer Enclosure	Hill

Intake Heights	
Siskin 1 FRM	2.6 m
Siskin 2 FRM	2.6 m
T640	2.8 m

Siskin Drive-470654002
North



Northeast



Siskin Drive-470654002
East



Southeast



Siskin Drive-470654002

South



Southwest



Siskin Drive-470654002

West



Northwest



East Ridge City Hall-Tombras Avenue



Rep Org name	CHATTANOOGA HAMILTON COUNTY AIR POLLUTION CONTROL BUREAU	<p>The PM_{2.5} site was originally established 5/6/1999 on the roof of the East Ridge Post Office, 1510 Maxwell Road, in the municipality of East Ridge in South Hamilton County near the Georgia border. It was moved to a temporary location behind the East Ridge City Hall on November 20, 2007. It was moved to a permanent location on the same property about 110 feet north on January 1, 2009. This site is roughly 3.5 miles from the Maple Street, North Georgia site, operated by the State of Georgia. The FRM was converted from WINS to VSCC on January 1, 2017.</p>
PQAO	0170	
Address	1517 TOMBRAS AVENUE, EAST RIDGE	
AQSID	470650031	
County Name	HAMILTON	
CBSA	CHATTANOOGA/ NORTH GEORGIA	
Lat	34.99438	
Lon	-85.24293	
Parameter Code	88101	
Parameter Name	PM _{2.5}	
Monitor Type	SLAMS	
POC	1	
Int	7	
Year	2020	
Collection Frequency	3 DAY	
Method	145-VSCC	
FRM/FEM instrument	R & P 2025 SEQ	
Analysis	GRAVIMETRIC –LAB: IML	
Ref Mtd ID	RFPS-0202-145	
Monitor Objective	POPULATION EXPOSURE	
Dominant Source	AREA	
Measurement Scale	NEIGHBORHOOD	
Land Use Type	COMMERCIAL	
Location Setting	URBAN AND CENTER CITY	
Elevation	720 FT ABOVE SEA LEVEL	
Closest Meteorological Site	CHATTANOOGA METROPOLITAN AIRPORT 1001 AIRPORT ROAD	
Date Site Established	5/6/1999 on POST OFFICE, MOVED 11/20/2007 TO BEHIND ER CITY HALL	

Site Evaluation 2020

1517 Tombras Avenue 470650031

(Former site at East Ridge Post Office, 1510 Maxwell Road)

Street Name	Average Daily Traffic Counts: TDOT website	Approximate Distance
Tombras Avenue	About 4,452 (Bennett Road) 2019 (Station #488)	.06 mile or 100 meters
Ringgold Road	21,412 2019 (#133)	.17 mile or 269 meters

Direction	Predominant Land Use (Industry, Residential, Commercial or Agricultural)
North	East Ridge High School (134 m), NE ER Community Center (64.8 m- 1 story)
South	Residential
East	City Hall, beyond City Hall is residential
West	Residential – municipality has highest population density in Hamilton County

Directions	Trees/Buildings	Height (m)	Distance (m)
Northwest	NW-Treeline Closest trees (1)	11.0 m	17.3 m
	(2)	14.0 m	19.4 m
South, SE	SE-3 Trees 1,2,3	9.2 m; 9.0 m; 9.0 m	19.7 m; 28.5 m; 31.9 m
	S-Treeline	18.0 m	41.4 m
East	One story building (City Hall)	3.7 m	22.5 m
West	Tree line	18.2	28.2
Southwest	Tree line	22.2	35.0

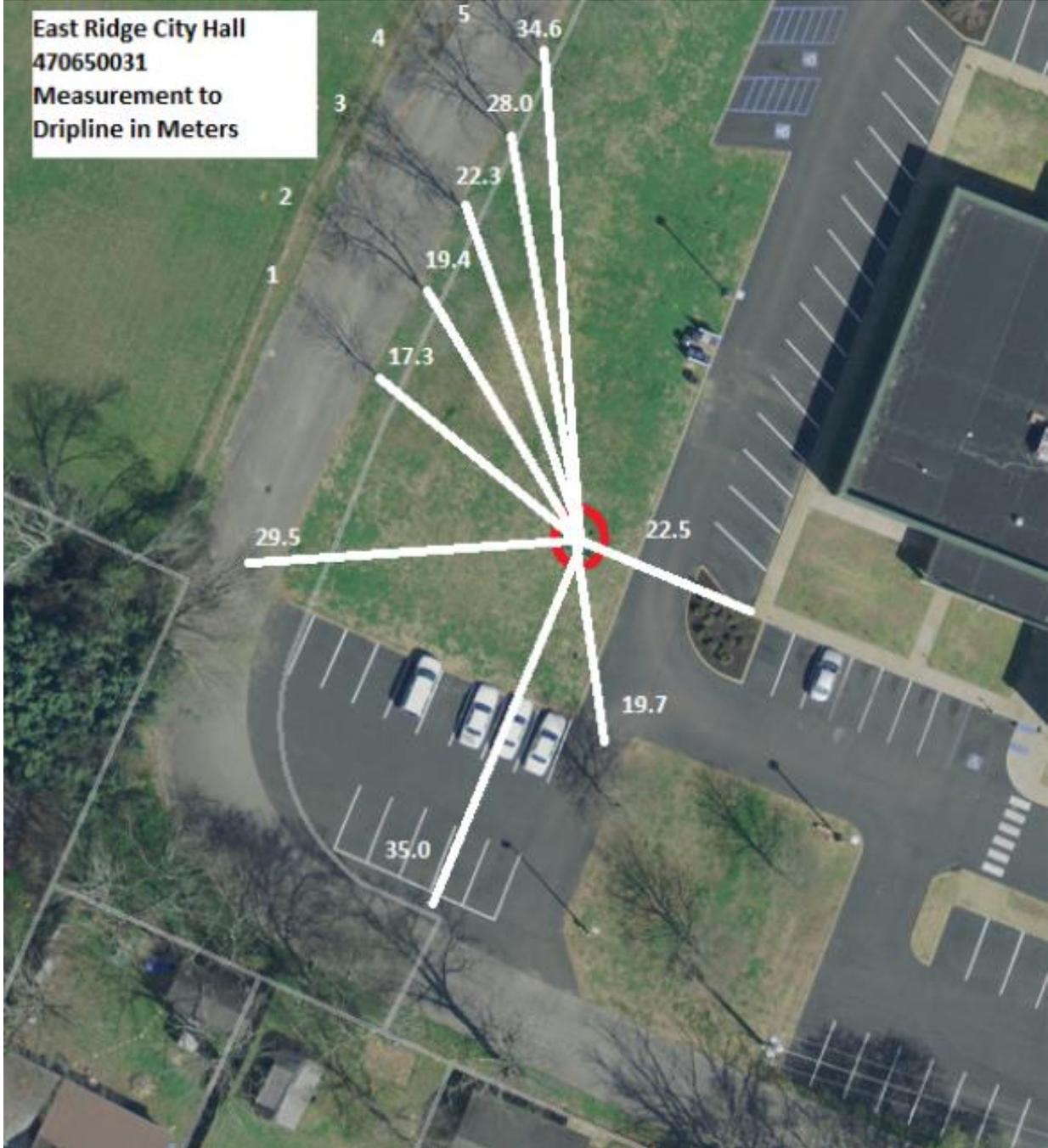
Directions	Topographic Features (hills, valleys, rivers)	General Terrain (flat, rolling, rough)
North	Flat	Flat
South	Flat	Flat
East	Flat	Flat
West	Flat	Flat

Intake Height	
East Ridge FRM	2.4 m

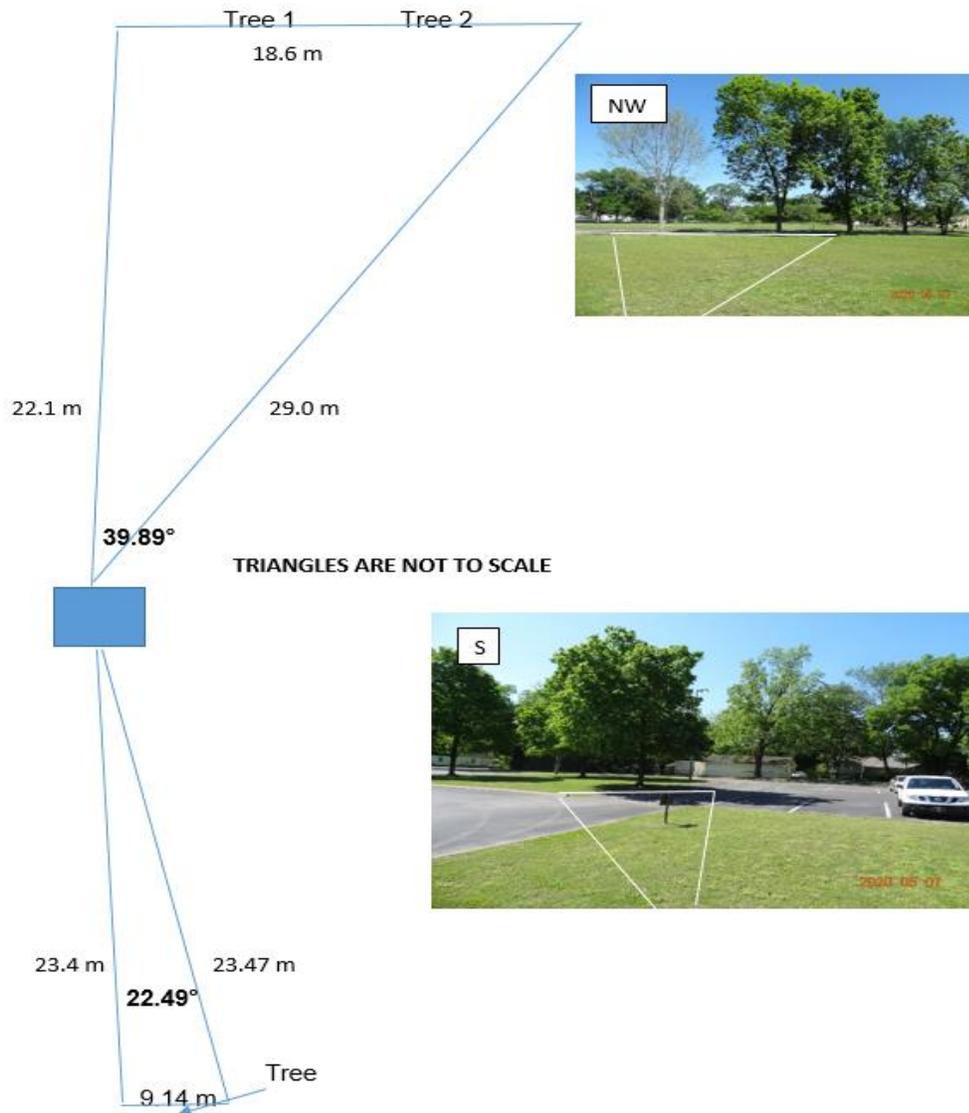
Figure 10- Aerial View of East Ridge City Hall Site 2018



Figure 11- East Ridge City Hall Marked with Distances to Driplines



Two trees to the Northwest of the site can be classified as obstructions and one tree to the south. A calculation was required to determine how much of the 90° quadrant was obstructed by the trees to the Northwest. The angle is calculated as 39.89°. The angle for the tree to the south is 22.49°. This means the air flow is obstructed 62.38°. Photographs are included to illustrate that the three trees in question are obstructing less than 90°. In the picture labeled Northwest, the left two trees are the ones obstructing as indicated by the imposed triangle. In the South view it is the central tree.



East Ridge City Hall- Tombras Avenue-470650031

North



Northeast



East Ridge City Hall- Tombras Avenue-470650031

East



Southeast



East Ridge City Hall- Tombras Avenue-470650031
South



Southwest



East Ridge City Hall- Tombras Avenue-470650031
West



Northwest



Appendix A
Memorandum of Understanding with State of Georgia

MEMORANDUM OF AGREEMENT

ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR

THE CHATTANOOGA-WALKER COUNTY

METROPOLITAN STATISTICAL AREA MSA

December 28, 2017

Participating Agencies:

Georgia

Georgia Department of Natural Resources (GA DNR)

Environmental Protection Division GA EPD APB

Tennessee

Chattanooga-Hamilton County Air Pollution Control Bureau (CHCAPCB)

I. PURPOSE/OBJECTIVES/GOALS

The purpose of the Memorandum of Agreement (MOA) is to establish the Chattanooga-Hamilton County-Walker County Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement between CHCAPCB and GAEPDAPB (collectively referred to as the "affected agencies") to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will establish the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Chattanooga-Hamilton County-Walker Co, GA MSA as required by 40 CFR 58 Appendix D, Section 2, (e) (March 28, 2016)¹.

II. BACKGROUND

The Chattanooga-Hamilton Co-Walker Co, GA MSA consists of the following counties: Dade, Walker, Catoosa, Hamilton, Marion, and Sequatchie. GA EPD APB has jurisdiction over Dade, Walker, and Catoosa Counties in Georgia and CHCAPCB has jurisdiction over Hamilton County, Tennessee. The State of Tennessee has jurisdiction over Marion and Sequatchie Counties in Tennessee, but does not have any permanent air monitoring sites in those counties. The CHCAPCB and GA EPD APB are required by the Clean Air Act to measure for certain criteria pollutants in the ambient air in the Chattanooga-Hamilton County-Walker Co, GA Metropolitan Statistical Area (MSA). The United States Environmental Protection Agency (EPA) has established minimum monitoring requirements based on the size of the MSA and the quality of the air in the

MSA for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone.

40 CFR 58 Appendix D, Section 2, (e)¹ states (in part):

“...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.”¹

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

I. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

- CHCAPCB and GA EPD APB (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 PM10, PM2.5, and ozone, as well as other 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 requirement (for PM10, PM2.5, and ozone described in 40 CFR 58) 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...”¹ 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 of this MOA. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies 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 disasters, or similar occurrences that result in a loss of more than 25% data in a quarter or a permanent change in the monitoring network. At least once a year in the second quarter of the year or before June 15th, each agency shall make available to the other agencies who are a party to this agreement, a copy of its proposed monitoring plan for the MSA for the next

year. The CHCAPCB will submit the network review that is submitted to the State of Tennessee for inclusion in the State's monitoring plan.

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

III. LIMITATIONS

- A. All commitments made in this MOA are subject to the availability of appropriated funds and each party's budget priorities. Nothing in this MOA, in and of itself, obligates CHCAPCB or GA EPD APB to expend appropriations 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 reimburse 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 that 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 CHCAPCB or GA EPD APB, their officers or employees, or any other person. This MOA does not direct or apply to any person outside CHAPCD or GAEPD APB.

V. PROPRIETARY INFORMATION AND INTELLECTUAL 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:

GA EPD APB DeAnna G. Oser
GAEPD APB Ambient Monitoring Program
4244 International Parkway, Suite 120
Atlanta, GA 30354

DeAnna.Oser@dnr.ga.gov

Voice: (404) 363-7004

FAX: (404) 363-7100

CHCAPCB Robert Colby
CHCAPCB
6125 Preservation Dr
Chattanooga, Tn 37416

rcolby@chattanooga.gov

Voice: (423) 643-5999

FAX: (423) 643-5972

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 the 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 agency at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

VIII. REFERENCE

1 – 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

**Georgia Department of Natural Resources, Environmental Protection Division
Air Protection Branch (GA EPD APB)**

BY: 
TITLE: DIRECTOR
DATE: 1/24/18

Chattanooga-Hamilton County Air Pollution Bureau (CHCAPCB)

BY: 
TITLE: Director
DATE: January 3, 2018