2021-2022
Air Monitoring Network Plan

City of Philadelphia
Department of Public Health
Air Management Services

July 1, 2021

Executive Summary

Philadelphia has an air monitoring network of ten air monitoring stations that house instruments that measure ambient levels of gaseous, solid, and liquid aerosol pollutants. It is operated by the City of Philadelphia's Department of Public Health, Air Management Services (AMS), the local air pollution control agency for the City of Philadelphia. This network is part of a broader network of air monitoring operated by our local states of Pennsylvania, New Jersey, Delaware and Maryland that make up the Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area (MSA).

The United States Environmental Protection Agency (US EPA) created regulations on how the air monitoring network is to be set up. These regulations can be found in Title 40 – Protection of Environment in the Code of Federal Regulations (CFR) Part 58 – Ambient Air Quality Surveillance, located online at: http://www.ecfr.gov/cgi-bin/text-idx?SID=86f79e0c1262e76604e10118aa3cc0ec&mc=true&node=pt40.6.58&rgn=div5.

Beginning July 1, 2007, and each year thereafter, AMS has submitted to EPA Region III, an Air Monitoring Network Plan (AMNP) which assures that the network stations continue to meet the criteria established by federal regulations.

Air monitoring provides critical information on the quality of air in Philadelphia. The objective for much of our network is to measure pollutants in areas that represent high levels of contaminants and high population exposure. Some monitoring is also done to determine the difference in pollutant levels in various parts of the City, provide long term trends, help bring facilities into compliance, provide real-time monitoring and provide the public with information on air quality.

Air monitoring data is submitted to the EPA on a quarterly basis. EPA's AirData website (https://www.epa.gov/outdoor-air-quality-data) provides access to air quality data collected at the monitors. On May 1st of the current year, AMS certifies the prior year's data. The annual data certification process is outlined in 40 CFR Part 58.15.

The proper siting of a monitor requires the specification of the monitoring objective, the types of sites necessary to meet the objective, and the desired spatial scale of representativeness. These are discussed in the section entitled "Definitions".

This Plan is composed of fourteen sections plus Appendices A – E:

1. **Public Participation** – This section provides information on how the public is made aware of the AMNP and where it is available for review.

2. **Definitions** – This section describes the terms used for air monitoring programs, measurement methods, monitoring objectives, spatial scales, air monitoring areas, pollutants, collection methods, and analysis methods.

3. **Current Network at a Glance** – This section shows the location of the monitoring sites and the pollutants measured at each site.

4. **Current Sites Summary** – This section provides information applicable to our overall network such as population. It also provides a brief overall purpose for each monitoring site.

5. **Direction of Future Air Monitoring** – This section gives a perspective of the major areas and initiatives AMS will be considering during the next few years.

6. **Proposed Changes to the Network** – This section describes changes that may occur within the next 18 months that would modify the network from how it is currently described in the AMNP.

7. **NCore Monitoring Network** – This section documents the NCore monitoring network codified in 40 CFR Part 58.10(a)(3) and 40 CFR Part 58 Appendix D section 3.

8. **Pb Monitoring Network** – This section documents the Pb monitoring network codified in 40 CFR Part 58.10(a)(4) and 40 CFR Part 58 Appendix D section 4.5.

9. **NO_2 Monitoring Network** – This section documents the NO_2 monitoring network codified in 40 CFR Part 58.10(a)(5) and 40 CFR Part 58 Appendix D section 4.3.

10. **SO_2 Monitoring Network** – This section documents the SO_2 monitoring network codified in 40 CFR Part 58.10(a)(6) and 40 CFR Part 58 Appendix D section 4.4.

11. **CO Monitoring Network** – This section documents the CO monitoring network codified in 40 CFR Part 58.10(a)(7) and 40 CFR Part 58 Appendix D section 4.2.

12. **$PM_{2.5}$ Monitoring Network** – This section documents the $PM_{2.5}$ monitoring network codified in 40 CFR Part 58.10(a)(8) and 40 CFR Part 58 Appendix D section 4.7.

13. **O_3 Monitoring Network** – This section documents the O_3 monitoring network codified in 40 CFR Part 58.10(a)(9) – (12) and 40 CFR part 58 Appendix D section 4.1.

14. **Detailed Information on Each Site** – This is the largest section of the AMNP. Each monitoring site is separately described in a table, complete with pictures and maps. The material is presented as:
    - A table providing information on the pollutants measured, sampling type, operating schedule, collection method, analysis method, spatial scale, monitoring objective, probe height, and begin date of each monitor;
    - Pictures taken at ground level of the monitoring station;
    - A map of the monitoring site complete with major cross streets and major air emission sources within 3000 meters (almost 2 miles); and
    - An aerial picture providing a north view of the site.

15. **Appendix A – PAMS Monitoring Implementation Plan**

16. **Appendix B – Philadelphia Air Quality Survey & Quality Assurance Project Plan**

17. **Appendix C – 2020 Community Scale Air Toxics Ambient Monitoring Grant**

18. **Appendix D – Proof of Publication**

19. **Appendix E – Comment and Response Document**

AMS has provided a copy of the AMNP for public inspection on the City's website at: https://www.phila.gov/departments/air-pollution-control-board/air-management-notices/.

Comments or questions concerning the air monitoring network or this Plan can be directed to:

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Public Participation

The Code of Federal Regulations (CFR) Title 40: Protection of Environment, Part 58: Ambient Air Quality Surveillance requires state and local air pollution control agencies to adopt and submit to the Environmental Protection Agency (EPA) Regional Administrator an Annual Monitoring Network Plan (AMNP) by July 1, 2021. The AMNP provides for the establishment and maintenance of an air quality surveillance system that consists of a network of monitoring stations. A proposed AMNP must be made available for public inspection and comment for at least 30 days prior to submission to EPA.

Air Management Services (AMS) is the local air pollution control agency for the City of Philadelphia under the Department of Public Health. Philadelphia has an air monitoring network of 10 air monitoring stations that house instruments that measure ambient levels of air pollutants.

The proposed AMNP is available for public inspection on the City's website at https://www.phila.gov/departments/air-pollution-control-board/air-management-notices/ and at the office of Air Management Services, 321 University Avenue, 2nd Floor, Philadelphia, PA 19104, during normal business hours. For further information, contact Mr. Jason Li, Engineering Supervisor of Program Services at (215) 685-9440.

Written comments on the proposed AMNP should be sent to Mr. Jason Li, Engineering Supervisor of Program Services, Air Management Services, 321 University Avenue, 2nd Floor, Philadelphia, PA 19104 or via email at jiazheng.li@phila.gov. Use "2021 Air Monitoring Network Plan" as the subject line in written communication. Only written comments will be accepted. Comments received by facsimile will not be accepted. Persons wishing to file comments on the proposed AMNP must submit comments by May 17, 2021.

Definitions

Air Monitoring Programs

EPA has established various air monitoring programs for the measurement of pollutants. Some of these are briefly described below. Later in this AMNP, air monitoring sites and monitoring equipment are specifically identified relative to these air monitoring programs:

- **CSN** – Chemical Speciation Network. It is a PM2.5 sampling network with sites located principally in urban areas.
- **NATTS** – National Air Toxics Trends Stations. This network provides ambient levels of hazardous air pollutants. These sites are established with the intent that they will operate over many years and provide both current and historical information.
- **NCore** – National Core multi-pollutant monitoring stations. Monitors at these sites are required to measure particles ($PM_{2.5}$, speciated $PM_{2.5}$, $PM_{10-2.5}$), O_3, SO_2, CO, nitrogen oxides ($NO/NO_2/NO_y$), and basic meteorology. They principally support research in air pollution control.
- **SLAMS** – State or Local Air Monitoring Stations. 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, Near-road NO_2/CO and all other State or locally operated stations that have not been designated as SPM stations.
- **PAMS** – Photochemical Assessment Monitoring Station for the enhanced monitoring of ozone, oxides of nitrogen (NOx), and volatile organic compounds (VOC) to obtain more comprehensive and representative data on ozone air pollution..
- **SPM** – Special Purpose Monitor. As the name implies these monitors are placed for purposes of interest to the city of Philadelphia. Often this monitoring is performed over a limited amount of time. Data is reported to the federal Air Quality System (AQS) and is not counted when showing compliance with the minimum requirements of the air monitoring regulations for the number and siting of monitors of various types.
- **Urban Air Toxics** – Urban Air Toxics (UAT) monitoring addresses toxic air pollutant emissions in urban areas. UAT air monitoring is regularly conducted for volatile organic compounds (VOCs).

Measurement Methods

- **Federal Equivalent Method (FEM)** – A method for measuring the concentration of an air pollutant in the ambient air that has been designated as an equivalent method in accordance with 40 CFR Part 53; it does not include a method for which an equivalent method designation has been canceled in accordance with 40 CFR Part 53.11 or 40 CFR Part 53.16.
- **Federal Reference Method (FRM)** – A method of sampling and analyzing the ambient air for an air pollutant that is specified as a reference method in an appendix to 40 CFR Part 50, or a method that has been designated as a reference method in accordance with this part; it does not include a method for which a reference method designation has been canceled in accordance with 40 CFR Part 53.11 or 40 CFR Part 53.16.

Monitoring Objectives

The ambient air monitoring networks must be designed to meet three basic monitoring objectives:

- Provide air pollution data to the general public in a timely manner.
- Support compliance with ambient air quality standards and emissions strategy development.
- Assist in the evaluation of 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 order to support the air quality management work indicated in the three basic air monitoring objectives, a network must be designed with a variety of different monitoring sites. Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region, and air pollution levels near specific sources.

Spatial Scales

The physical siting of the air monitoring station must be consistent with the objectives, site type and the physical location of a particular monitor.

The goal in locating monitors is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring site type, air pollutant to be measured, and the monitoring objective.

The spatial scale results from the physical location of the site with respect to the pollutant sources and categories. It estimates the size of the area surrounding the monitoring site that experiences uniform pollutant concentrations. The categories of spatial scale are:

- **Microscale** – Defines concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters.
- **Middle scale** – Defines concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometer.
- **Neighborhood scale** – Defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers range. The neighborhood and urban scales listed below have the potential to overlap in applications that concern secondarily formed or homogeneously distributed air pollutants.
- **Urban scale** – Defines concentrations within an area of city-like dimensions, on the order of 4 to 50 kilometers. Within a city, the geographic placement of sources may result in there being no single site that can be said to represent air quality on an urban scale.
- **Regional scale** – Defines usually a rural area of reasonably homogeneous geography without large sources, and extends from tens to hundreds of kilometers.
- **National and global scales** – These measurement scales represent concentrations characterizing the nation and the globe as a whole.

Air Monitoring Area

- **Core-Based Statistical Area (CBSA)** – Defined by the U.S. Office of Management and Budget, as a statistical geographic entity consisting of the county or counties associated with at least one urbanized area/urban cluster of at least a population of 10,000 people, plus adjacent counties having a high degree of social and economic integration.
- **Metropolitan Statistical Area (MSA)** – A Core-Based Statistical Area (CBSA) associated with at least one urbanized area of a population of 50,000 people or more. The central county plus adjacent counties with a high degree of integration comprise the area.

Pollutants and Parameters

Air Management Services monitors for a wide range of air pollutants and parameters:

- **Criteria Pollutants** are measured to assess if and how well we are meeting the National Ambient Air Quality Standards (NAAQS) that have been set for each of these pollutants. These standards are set to protect the public's health and welfare.
  - **Ozone (O_3)**
  - **Sulfur Dioxide (SO_2)**
  - **Carbon Monoxide (CO)**
  - **Nitrogen Dioxide (NO_2)**
    - NO means nitrogen oxide.
    - NO_X means oxides of nitrogen and is defined as the sum of the concentrations of NO_2 and NO.
    - NO_y means the sum of all total *reactive* nitrogen oxides, including NO, NO_2, and other nitrogen oxides referred to as NO_Z.
  - **Particulate**
    - $PM_{2.5}$ means particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
    - PM_{10} means particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
    - PM Coarse means particulate matter with an aerodynamic diameter greater than 2.5 micrometers and less than 10 micrometers.
    - Ultrafine Particulate Matter means particulate matter with an aerodynamic diameter less than 0.1 micrometers.
  - **Lead (Pb)**
- **BaP** – means Benzo(a)Pyrene, a polycyclic aromatic hydrocarbon that is a product of incomplete combustion or burning organic (carbon-containing) items.
- **Black Carbon** – Black Carbon is a major component of "soot", a complex and most strongly absorbing component of particulate matter (PM), that is formed by the incomplete combustion of fossil fuels, biofuels, and biomass.
- **MET** – Meteorology parameters that may include temperature, relative humidity, barometric pressure, wind speed, wind direction, mixing height, precipitation, solar and UV radiation.
- **Speciated $PM_{2.5}$** – $PM_{2.5}$ particles are analyzed to identify their makeup (60 components including elements, radicals, elemental carbon, and organic carbon) and help assess the level of health risk and identify sources that are contributing to the levels of $PM_{2.5}$ being measured.

- **Toxics** – Approximately 44 compounds, carbonyls – 7 compounds, and metals - 7 elements are toxic and are measured to assess the risk of cancer and non-cancer caused by these pollutants. The VOC compounds are analyzed by GC/MS (EPA Compendium Method TO-15); carbonyls are analyzed by HPLC or uHPLC, and metals by ICP-MS(WV).
- **PAMS Volatile Organic Compounds (VOC)** – Approximately 57 of these compounds are monitored to assist in understanding the formation of ozone and how to control this pollutant. These compounds are analyzed by Auto GC-FID.

Collection Methods

Particulate samples

- **Broadband Spectroscopy PM Mass Monitor** – This instrument provides continuous PM2.5 real-time mass measurements using broadband spectroscopy which combines advanced LED technology with light scattering theory. Certain PM Mass Monitor Models provide simultaneous, continuous PM10 and PM2.5, real-time PM mass measurements.

The following instruments provide concentration values of particulate over a 24-hour period. Laboratory analysis is required before the concentration of particulate can be determined.

- **Hi-Vol** – High-Volume Air Samplers (HVAS) are used to determine the concentration of particulate matter in the air. All collected material is defined as total suspended (in the air) particulates (TSP), including lead (Pb) and other metals. A Hi-Volume sampler consists of two basic components: a motor similar to those used in vacuum cleaners and an air flow control system.
- **Met One SASS** – Filters used to collect PM measurement of total mass by gravimetry, elements by x-ray fluorescence.
- **Filter-based $PM_{2.5}$** – Filter-based $PM_{2.5}$ monitors an air sample drawn through a Teflon filter for 24 hours.
- **URG** – Filters used to collect PM measurement of organic and elemental carbon.

Gaseous / criteria pollutants

- **Instrumental - Data from these instruments is telemetered to a central computer system and values are available in near "real time".** An analyzer used to measure pollutants such as: carbon monoxide, sulfur dioxide, nitrogen oxides and ozone.

Toxic and organic (VOC) pollutants

- **SS Canister Pressurized** – Ambient air is collected in stainless-steel canisters, cryogenically concentrated using liquid nitrogen and analyzed for target VOCs and other organic components by GC-FID and GC-MS.
- **Canister Sub Ambient Pressure** – Collection of ambient air into an evacuated canister with a final canister pressure below atmospheric pressure.
- **DNPH-Coated Cartridges** – Cartridges are coated with 2,4-dinitrophenylhydrazine (DNPH). This is used for carbonyl determination in ambient air. Ultra-High and High Performance Liquid Chromatography (uHPLC and HPLC) measures the carbonyl.

Analysis Methods

Particulate concentration

- **Gravimetric** – The determination of the quantities of the constituents of a compound, describes a set of methods for the quantitative determination of an analyte based on the weight of a solid. Laboratory analysis is needed.
- **Broadband Spectroscopy** – Broadband spectroscopy combines advanced LED technology with light scattering theory. Certain PM Mass Monitor Models provide simultaneous, continuous PM10 and PM2.5, real-time PM mass measurements.

Composition/make-up of particulates

- **Energy Dispersive XRF** – Energy dispersive x-Ray Fluorescence Spectrometer for the determination of species in ambient particulate matter.
- **Ion Chromatography –** Ion-exchange chromatography (or ion chromatography) is a chromatography process that separates ions and polar molecules based on their affinity to the ion exchanger for the determination of species in ambient particulate matter.
- **IMPROVE –** Thermal Optical Reflectance (TOR) analysis using the Interagency Monitoring of Protected Visual Environments (IMPROVE)_A protocol.
- **Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) –** Inductively Coupled Plasma/Mass Spectrometry for the determination of metals including Lead concentration in ambient particulate matter.

Gaseous / criteria pollutants

- **Nitrogen Oxides – Chemiluminescence** – Emission of light as a result of a chemical reaction at environmental temperatures. This analysis is used for NO, NO_x, and NO_y. NO_2 is calculated as NO_x- NO. True NO2 monitoring technology provides a direct NO2 measurement. The instrument utilizes a Cavity Attenuated Phase Shift (CAPS) technique.
- **Carbon Monoxide – Gas Filter Correlation** – Measures low ranges of carbon monoxide by comparing infrared energy absorbed by a sample to that absorbed by a reference gas according to the Beer-Lambert law. Using a Gas Filter Correlation Wheel, a high energy IR light source is alternately passed through a CO filled chamber and a chamber with no CO present. The light path then travels through the sample cell, which has a folded path of 14 meters. The energy loss through the sample cell is compared with the span reference signal provided by the filter wheel to produce a signal proportional to concentration.
- **Sulfur Dioxide** – **UV Fluorescent** – UV Fluorescence Sulfur Dioxide Analyzer is a microprocessor controlled analyzer that determines the concentration of sulfur dioxide (SO2), in a sample gas drawn through the instrument's sample chamber where it is exposed to ultraviolet light, which causes any SO2 present to fluoresce. The instrument measures the amount of fluorescence to determine the amount of SO2 present in the sample gas.
- **Ozone** – **Ultra Violet -** A light, which supplies energy to a molecule being analyzed. Ozone is analyzed with UV.

Toxic and volatile organic pollutants

- **Cryogenic Preconcentration GC-FID** – Cryogenic Preconcentration Gas Chromatograph/Flame Ionization Detector - air injection volume for capillary GC combined with low concentrations of analyte require that samples be preconcentrated prior to GC analysis. Sample preconcentration is accomplished by passing a known volume of the air sample through a trap filled with fine glass beads that is cooled to

-180ºC. With this technique, the volatile hydrocarbons of interest are quantitatively retained in the trap, whereas the bulk constituents of air (nitrogen, oxygen, etc.) are not. The air sample is collected in a vessel of known volume. A portion of this volume is analyzed and used to calculate concentration of each compound in the original air sample after Gas Chromatographic (Flame Ionization Detector, GC-FID) analysis. The sample trapped cryogenically on the glass beads is thermally desorbed into a stream of ultra-pure helium and re-trapped on the surface of a fine stainless steel capillary cooled to -180º C. This second cryogenic trapping stage "focuses" the sample into a small linear section of tubing. The cold stainless steel capillary is ballistically heated (by electrical resistance) and the focused sample quickly desorbs into the helium stream and is transferred to the chromatographic column. Cryogen (liquid nitrogen, LN_2) is used to obtain sub ambient temperatures in the VOC concentration and GC. This analysis is used to determine the concentration of Benzene and other organic compounds and VOC in the atmosphere.

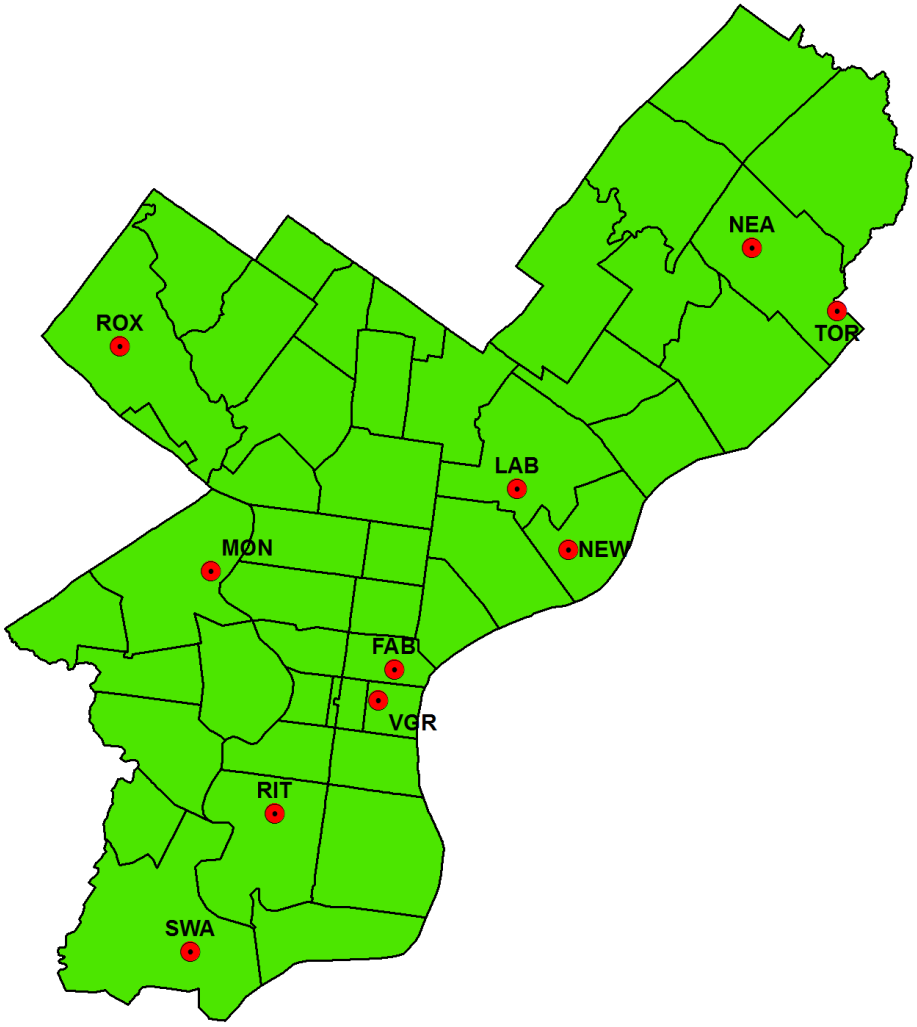
- **GC-MS** – Gas Chromatograph/Mass Spectrometer**.** Analysis of organic or VOC are conducted using a gas chromatograph (GC) with a mass spectrometer (MS) attached as the detector. Cryogenic preconcentration with liquid nitrogen (LN_2) is also used to trap and concentrate sample components.
- **Auto GC-FID** – Automated Gas Chromatograph. Continuous hourly analysis of VOC using airmoVOC C2-C6 (light volatile hydrocarbons) and airmoVOC C6-C12 (heavy volatile hydrocarbons) analyzers with Flame Ionization Detection.
- **High Pressure Liquid Chromatography (HPLC)** – The analytical method used to analyze carbonyl compounds such as acetaldehyde and formaldehyde. Carbonyl compounds are collected on the sampling media as their 2,4-dinitrohydrazine derivatives. The derivatives are separated by liquid chromatography (LC) on a packed column by means of a solvent mixture under high pressure (HPLC) followed by UV detection of each carbonyl derivative. Ultra-High Performance Liquid Chromatography (uHPLC) allows for faster analysis time as well as chromatograms with greater resolution.

Current Network at a Glance

The City of Philadelphia is served by a network of ten air monitoring sites located throughout the City that measure the criteria pollutants (except lead[1]): ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM_{10} and $PM_{2.5}$). Four of the sites also measure toxics, such as benzene, acetaldehyde, and formaldehyde. The map below shows the location of air monitors and the pollutants measured at each monitor location.

[1] EPA waved monitoring lead since 2017 because the 2014-2016 design value was 0.04 ug/m^3.

Figure 1 - 2021 Philadelphia Air Monitoring Network as of July 1, 2021



			Parameter																	
AQS Site Code	AMS Site	Address	CO	SO_2	Ozone	NO_2	NOy/NO	PM_{10}	$PM_{2.5}$	Speciated $PM_{2.5}$	PM Coarse	Black Carbon / Ultrafine PM	Carbonyls	PAMS VOC	BaP	TSP Metals (Be, Cr, Mn, Ni, As, Cd, Pb)	Toxics TO15	MET	AMS Site
421010004	**LAB**	1501 E. Lycoming St			X				X										**LAB**
421010014	**ROX**	Eva & Dearnley Sts											X				X		**ROX**
421010024	**NEA**	Grant Ave & Ashton Rd			X														**NEA**
421010048	**NEW**	2861 Lew is St	X	X	X	X	X	X	X	X	X		X	X			X	X	**NEW**
421010055	**RIT**	24th & Ritner Sts		X					X	X			X			X	X		**RIT**
421010057	**FAB**	3rd & Spring Garden Sts							X										**FAB**
421010063	**SWA**	8200 Enterprise Ave											X				X		**SWA**
421010075	**TOR**	4901 Grant Ave & James St	X			X			X									X	**TOR**
421010076	**MON**	I-76 & Montgomery Drive	X			X			X			X			X	X		X	**MON**
	VGR	6th & Arch Sts			X				X									X	**VGR**

Summary of Current Sites

All of our ten monitoring sites are located in Philadelphia, PA:

State: Pennsylvania
City: Philadelphia
County: Philadelphia
Metropolitan Statistical Area (MSA): Philadelphia – Camden - Wilmington, PA-NJ-DE-MD
MSA number: 37980
Population: 6,102,434 (2019 annual estimate)[2]
EPA Region: III, Philadelphia
Class I area: Brigantine Natural Wildlife Preserve near Atlantic City, NJ
City population: 1,584,064 (2019 annual estimate)[3]
Time zone: EST
UTM zone: 18

[2] MSA population estimates from:
https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-metro-and-micro-statistical-areas.html
[3] Philadelphia County population estimates from:
https://www.census.gov/data/tables/time-series/demo/popest/2010s-counties-total.html

Table 1 – Site Summary Table

AQS Site Code	AMS Site	Address	Statement of Purpose
421010004	**LAB**	1501 E. Lycoming St.	Built in 1964, is a good site to test new or complex monitoring methods as laboratory staff are readily available.
421010014	**ROX**	Eva & Dearnley Sts.	Periphery site.
421010024	**NEA**	Grant Ave & Ashton Rd.	Periphery site. High Ozone.
421010048	**NEW**	2861 Lewis St.	Originally sited to measure the impact of Franklin Smelting and Refining (now closed), MDC (now closed), and the waste water treatment plant. In 2013, the NCore site was re-located here and in 2017 is a designated PAMS site.
421010055	**RIT**	24th & Ritner Sts.	This site was selected to help assess the impact of the petroleum refinery on the local community. The area was identified by air quality modeling.
421010057	**FAB**	3rd & Spring Garden Sts.	This site was established to represent the highest levels of $PM_{2.5}$ in the City based on EPA Region III's air quality modeling of air toxics in Philadelphia. It shows high levels of $PM_{2.5}$ created by vehicle traffic.
421010063	**SWA**	8200 Enterprise Ave.	This site was established to measure toxics, carbonyls, and metals. EPA Region III modeling analysis showed areas near the airport to have high levels of aldehydes.
421010075	**TOR**	4901 Grant Ave & James St.	This site was established as the 1st near-road NO_2 monitor in the Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area.
421010076	**MON**	I-76 & Montgomery Drive	This site was established as the 2nd near-road NO_2 monitor in the Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area.
	VGR	6th & Arch Sts.	EPA's Village Green Air Monitoring Station. Utilizes solar and wind turbine power as energy sources. Sited to increase community awareness of environmental conditions.

Direction of Future Air Monitoring

The agency will study and assess the overall monitoring program within the City to determine the course of future changes to the air monitoring network.

The agency will focus on the following:

- The agency will consider monitoring data from the Philadelphia Air Quality Survey (PAQS) project, the Community Scale Air Toxics Ambient Monitoring grant, the mobile monitoring project, and other monitoring projects to evaluate concentrations of air pollutants throughout the city. Based on these results and funding from EPA, the agency plans to propose updates to FRM/FEM and air toxics monitoring locations if needed.

- Improve the understanding of particulate and air toxic pollutants in Philadelphia.

    - The agency plans to pursue negotiations with the port entities in order to implement monitoring and emission inventory efforts in this location.

- The agency would like to consider Environmental Justice during the development of the Air Monitoring Network Plan and look to investigate concentrations in these communities.

- The agency would like to consider the establishment of an asset management framework for the monitoring system and develop an air quality monitoring modernization plan as opportunities for sustainability.

- The agency would like to understand the performance and remedy the challenges on the use of low-cost sensors to provide real-time, local-scale air quality information.

Proposed Changes to the Network

Below are changes that are anticipated to occur over the next 18 months to the existing air monitoring network:

- March 2021 – December 2022

    - PAMS Monitoring set to begin by June 1, 2021.
        - See Appendix A for latest PAMS Monitoring Implementation Plan.

    - Establish a $PM_{2.5}$ monitor at LAB – starting date to be determined.

    - Real-time data is planned to be available in the Summer of 2021 at https://www.pandonia-global-network.org for the PANDORA spectrometer installed in March of 2021 at the NEW site. The PANDORA spectrometer is an operational research instrument from National Aeronautics and Space Administration (NASA) in partnership with EPA that takes column measurements of O_3, SO_2, formaldehyde, BrO, NO_2, and H_2O available at PAMS sites.

    - Philadelphia Air Quality Survey.
        - AMS will continue to maintain sites and sample ambient air as shown in Appendix B.

    - AMS awarded EPA's Community-Scale Air Toxics Ambient Monitoring grant for 2020.
        - See Appendix C for more information.

    - A mobile monitoring station is planned to be added in the Fall of 2021 that will measure BTEX (Benzene, Toluene, Ethylbenzene, m-, o-, and p- Xylene), NO, NO_2, SO_2, O_3, $PM_{2.5}$, meteorological data, CO, CO_2, CH_4, H_2O, and Total VOCs measurement calibrated to Isobutylene. A modified Ford Transit 250 will include GPS to track speed and direction and can be used while the vehicle is in motion or stationary.

    - AMS plans to assist EPA on a port monitoring project.

NCore Monitoring Network

The requirements for the NCore air monitoring network are codified in 40 CFR Part 58.10(a)(3) and 40 CFR Part 58 Appendix D section 3.

The NCore station is located at NEW.

As codified in 40 CFR Part 58 Appendix D section 5(a), PAMS measurements are required at NCore sites that are in Core-Based Statistical Areas (CBSAs) with populations of 1,000,000 or more. 40 CFR Part 58.13(h) requires the PAMS sites to be established and operating no later than June 1, 2021.

The PAMS Monitoring Implementation Network Plan is included in Appendix A.

Pb Monitoring Network

The requirements for the Pb air monitoring network are codified in 40 CFR Part 58.10(a)(4) and 40 CFR Part 58 Appendix D section 4.5.

Philadelphia County has no source oriented Pb sources that emit 0.50 or more tons per year.

NO_2 Monitoring Network

The requirements for the NO_2 air monitoring network are codified in 40 CFR Part 58.10(a)(5) and 40 CFR Part 58 Appendix D section 4.3.

AMS currently operates an NO_2 monitor that meets the area-wide monitoring requirements. The first near-road NO_2 monitor was established at TOR and started operation on January 1, 2014. The second near-road NO_2 monitor is located at MON and started operation on July 20, 2015.

SO_2 Monitoring Network

The requirements for the SO_2 air monitoring network are codified in 40 CFR Part 58.10(a)(6) and 40 CFR Part 58 Appendix D section 4.4.

CO Monitoring Network

The requirements for the CO air monitoring network are codified in 40 CFR Part 58.10(a)(7) and 40 CFR Part 58 Appendix D section 4.2.

The Philadelphia-Camden-Wilmington, PA-NJ-DE-MD CBSA has a CO monitor collocated with the near-road NO_2 monitor at TOR and has been operational since January 1, 2014.

$PM_{2.5}$ Monitoring Network

The requirements for the $PM_{2.5}$ air monitoring network are codified in 40 CFR Part 58.10(a)(8) and 40 CFR Part 58 Appendix D section 4.7.

The requirement for at least one $PM_{2.5}$ monitor to be collocated at a near-road NO_2 station for CBSAs with a population of 1,000,000 or more persons is met at the TOR monitoring site.

O_3 Monitoring Network

The requirements for the O_3 air monitoring network are codified in 40 CFR Part 58.10(a)(9) – (12) and 40 CFR Part 58 Appendix D section 4.1.

AMS currently operates three O_3 monitors.

Enhanced Monitoring Plan

40 CFR Part 58 Appendix D. 5(h) requires: "*States with Moderate and above 8-hour O3 nonattainment areas and states in the Ozone Transport Region as defined in 40 CFR 51.900 shall develop and implement an Enhanced Monitoring Plan (EMP) detailing enhanced O3 and O3 precursor monitoring activities to be performed. The EMP shall be submitted to the EPA Regional Administrator no later than October 1, 2019 or two years following the effective date of a designation to a classification of Moderate or above O3 nonattainment, whichever is later. At a minimum, the EMP shall be reassessed and approved as part of the 5-year network assessments required under 40 CFR 58.10(d). The EMP will include monitoring activities deemed important to understanding the O3 problems in the state. Such activities may include, but are not limited to, the following:*

(1) Additional O_3 monitors beyond the minimally required under paragraph 4.1 of this appendix,

(2) Additional NO_x or NO_y monitors beyond those required under 4.3 of this appendix,

(3) Additional speciated VOC measurements including data gathered during different periods other than required under paragraph 5(g) of this appendix, or locations other than those required under paragraph 5(a) of this appendix, and

(4) *Enhanced upper air measurements of meteorology or pollution concentrations*."

Please note only States, not local counties, are required to submit an EMP to the EPA. AMS will work with PADEP for enhanced O_3 and O_3 precursor monitoring.

Currently, AMS monitors the following beyond the minimal requirements:

(1) Year round ozone monitoring at all sites.

Pending funding for EMPs, AMS cannot guarantee that year round monitoring will continue.

PAMS Monitoring Implementation Network Plan is included in Appendix A.

Detailed Information on Each Site

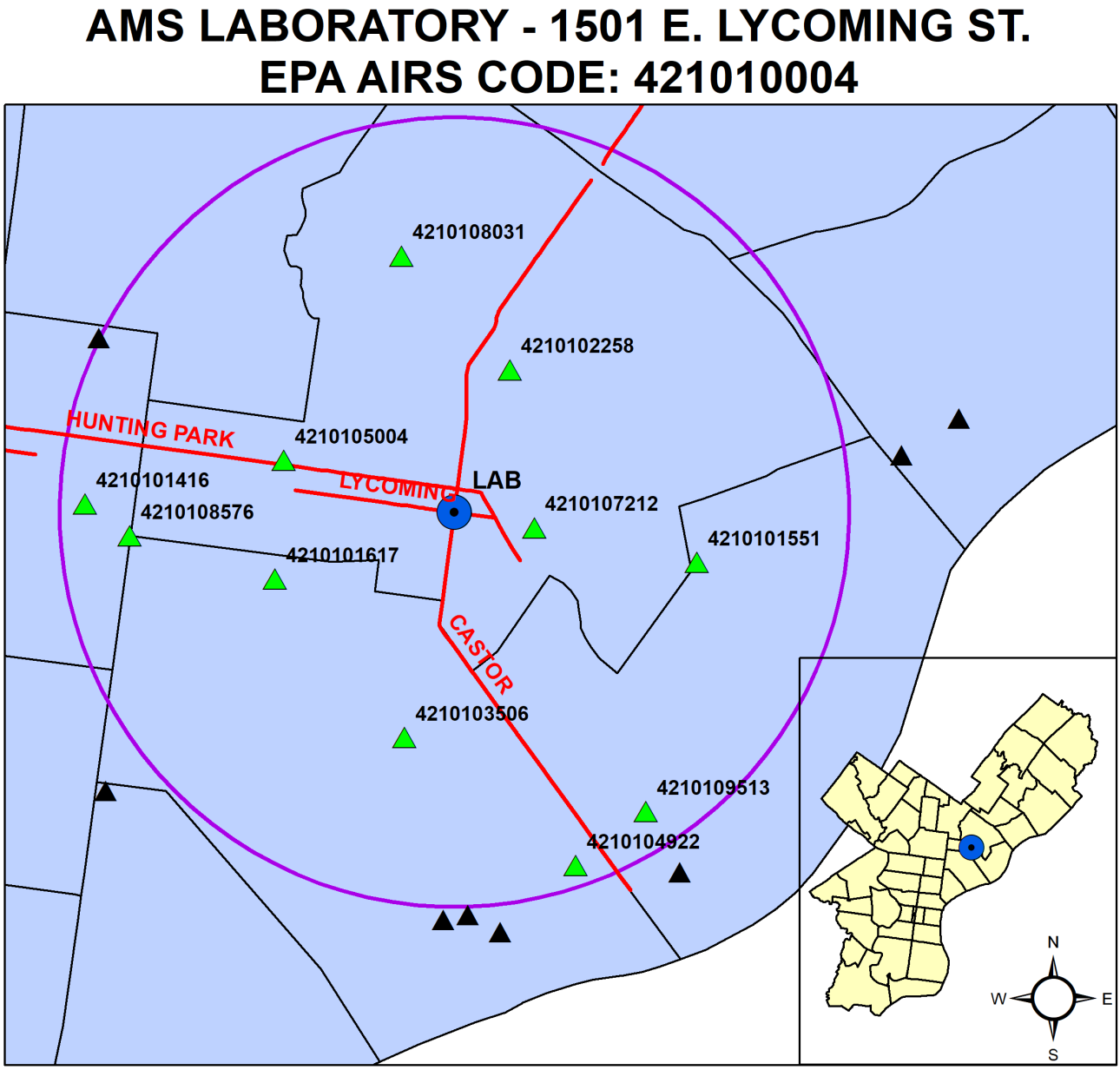
The tables that follow provide detailed information for each of the 10 monitoring stations in Philadelphia County. As per 40 CFR Part 58.10(a)(1), the siting and operation of each monitor in the 2021-2022 AMNP meets the requirements of 40 CFR Part 58 and Appendices A, B, C, D, and E of this part where applicable.

Table 2 – Detailed LAB Information with Monitoring Station Picture

AMS SITE ID: LAB
AQS Site ID: 421010004
Street Address: 1501 E. Lycoming Street, 19124
Geographical Coordinates
Latitude: 40.008889
Longitude: -75.09778

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
Ozone	SLAMS		Continuous	Instrumental	Ultraviolet Absorption	Year-round operation	44201	2	087	Neighborhood	Population Exposure	7	1/1/2018
PM2.5 Continuous	SLAMS		Continuous	Teledyne T640 at 5.0 LPM	Broadband Spectroscopy		88101	4	236	Neighborhood	Population Exposure	2	TBD

Figure 2 – LAB Monitoring Site Map with Major Streets and Major Emission Sources



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210104922	PHILA GAS WORKS/RICHMOND PLT	3100 E VENANGO ST	0.000	2.820	4.756	0.293	0.254	0.032	0.231
4210109513	NORTHEAST WPCP/PHILA	3899 RICHMOND ST	0.000	5.313	4.920	3.951	3.951	0.469	5.633
4210103506	PTR BALER AND COMPACTOR/PHILA	2207 E ONTARIO ST	0.000	0.388	0.484	0.038	0.038	0.048	21.685
4210101617	PUROLITE INC/MFG CHEM	3620 G ST	0.000	2.524	3.005	0.228	0.228	0.018	2.683
4210101551	ADVANSIX INC	4700 BERMUDA ST	0.000	84.476	270.547	68.671	55.319	60.663	104.475
4210108576	ST CHRISTOPHERS HOSP FOR CHILDREN/PHILA	ERIE AVE & FRONT ST	0.000	3.424	6.161	0.453	0.452	0.204	0.413
4210107212	DOMESTIC LINEN SUPPLY CO INC/PHILADELPHIA	4100 FRANKFORD AVE	0.000	0.893	1.066	1.009	1.009	0.007	19.050
4210101416	TDPS MATERIALS INC/ASPHALT PLT	3870 N 2ND ST	0.000	9.080	1.820	1.610	0.200	0.240	2.240
4210105004	MIPC LLC/ PHILA	4210 G ST	0.000	0.000	0.000	0.000	0.000	0.000	24.790
4210102258	FRONTIDA BIOPHARM INC	1100 ORTHODOX ST	0.000	1.182	1.448	0.110	0.039	0.012	2.431
4210108031	FRIENDS HOSP/PHILA	4641 ROOSEVELT BLVD	0.000	1.694	2.077	0.065	0.043	0.017	0.114

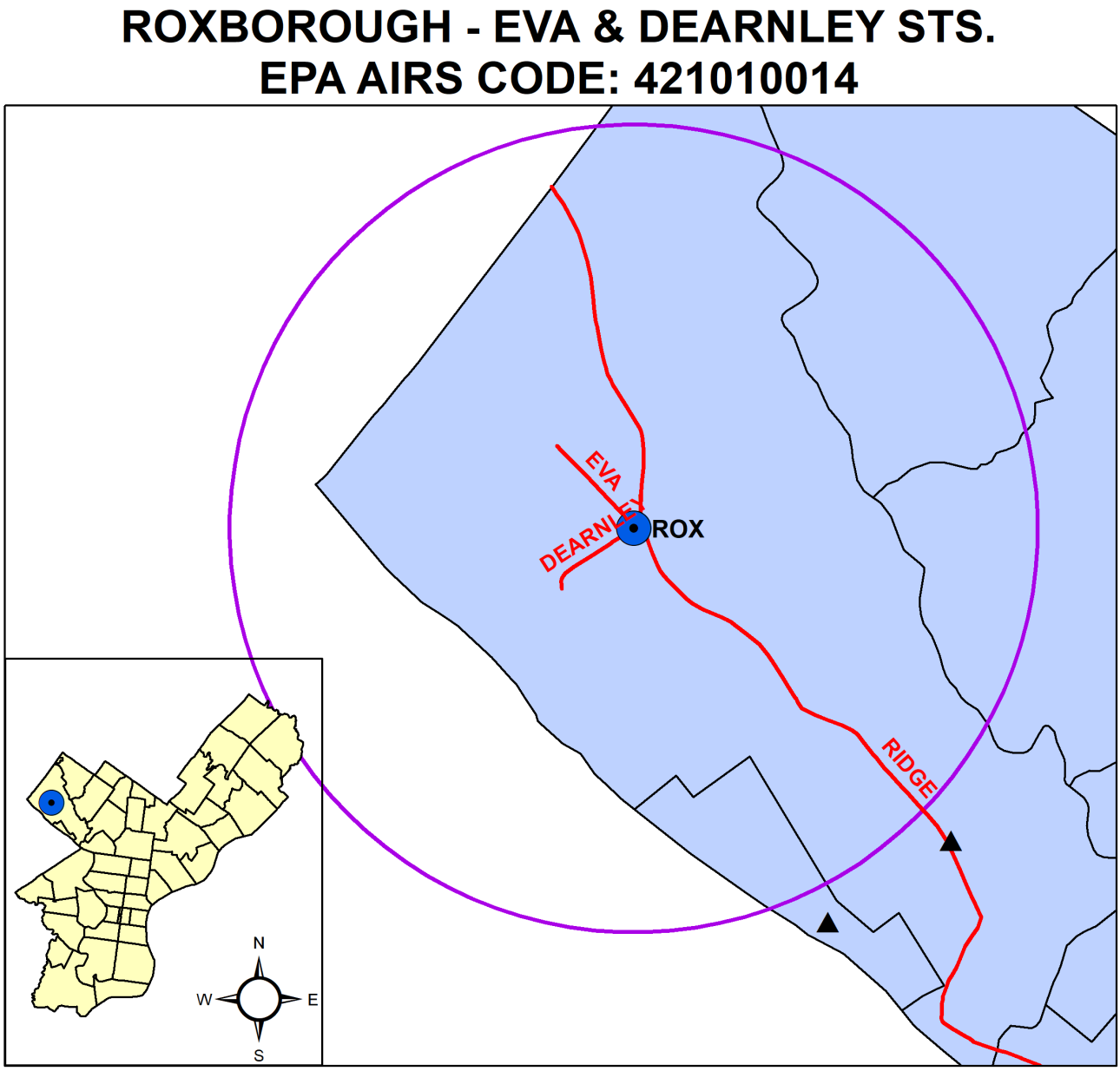
Figure 3 – LAB North Aerial View

Table 3 – Detailed ROX Information with Monitoring Station Picture

AMS SITE ID: ROX
AQS Site ID: 421010014
Street Address: Eva & Dearnley Streets
Geographical Coordinates
Latitude: 40.049604
Longitude: -75.241209

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
Carbonyls	Other	Urban Air Toxics	1/6 days	DNPH-Coated Cartridges	HPLC		Vary	2	102	Neighborhood	Population Exposure	4	5/7/2003
Toxics	Other	Urban Air Toxics	1/6 days	Canister Subambient Pressure	Multi-Detector GC		Vary	4,5	150	Neighborhood	Population Exposure	4	1/1/2004

Figure 4 – ROX Monitoring Site Map with Major Streets and Major Emission Sources



			2018 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC

Figure 5 – ROX North Aerial View

Table 4 – Detailed NEA Information with Monitoring Station Picture

AMS SITE ID: NEA
AQS Site ID: 421010024
Street Address: Grant Ave & Ashton Rd
Geographical Coordinates
Latitude: 40.076389
Longitude: -75.011944

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
Ozone	SLAMS		Continuous	Instrumental	Ultraviolet Absorption	Year-round operation	44201	1	087	Neighborhood	Highest concentration	6	1/1/1974

Figure 6 – NEA Monitoring Site Map with Major Streets and Major Emission Sources

			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210108008	NAZARETH HOSP/PHILA	2601 HOLME AVE	0.000	1.724	2.380	0.088	0.064	0.037	0.130
4210108076	JEFFERSON TORRESDALE HOSPITAL	RED LION & KNIGHTS RD	0.000	7.301	10.344	0.521	0.000	0.122	0.807
4210102030	RYDER TRUCK RENTAL INC/BLUEGRASS RD	9751 BLUE GRASS RD	0.000	0.020	0.100	0.003	0.000	0.001	0.241
4210103846	NATL PUB CO/ROOSEVELT BLVD	11311 ROOSEVELT BLVD	0.000	0.522	0.623	0.046	0.046	0.003	2.955

Figure 7 – NEA North Aerial View

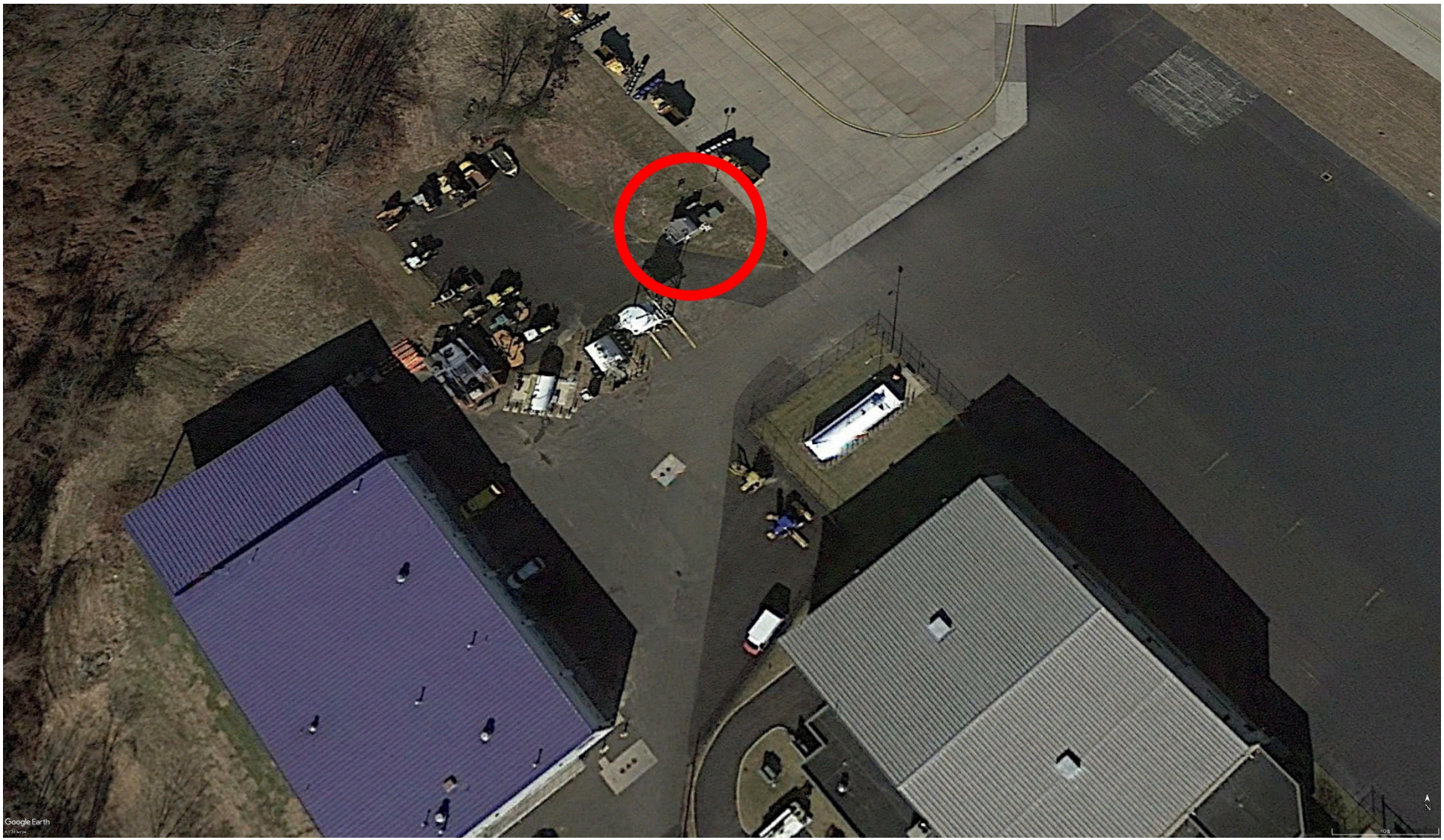


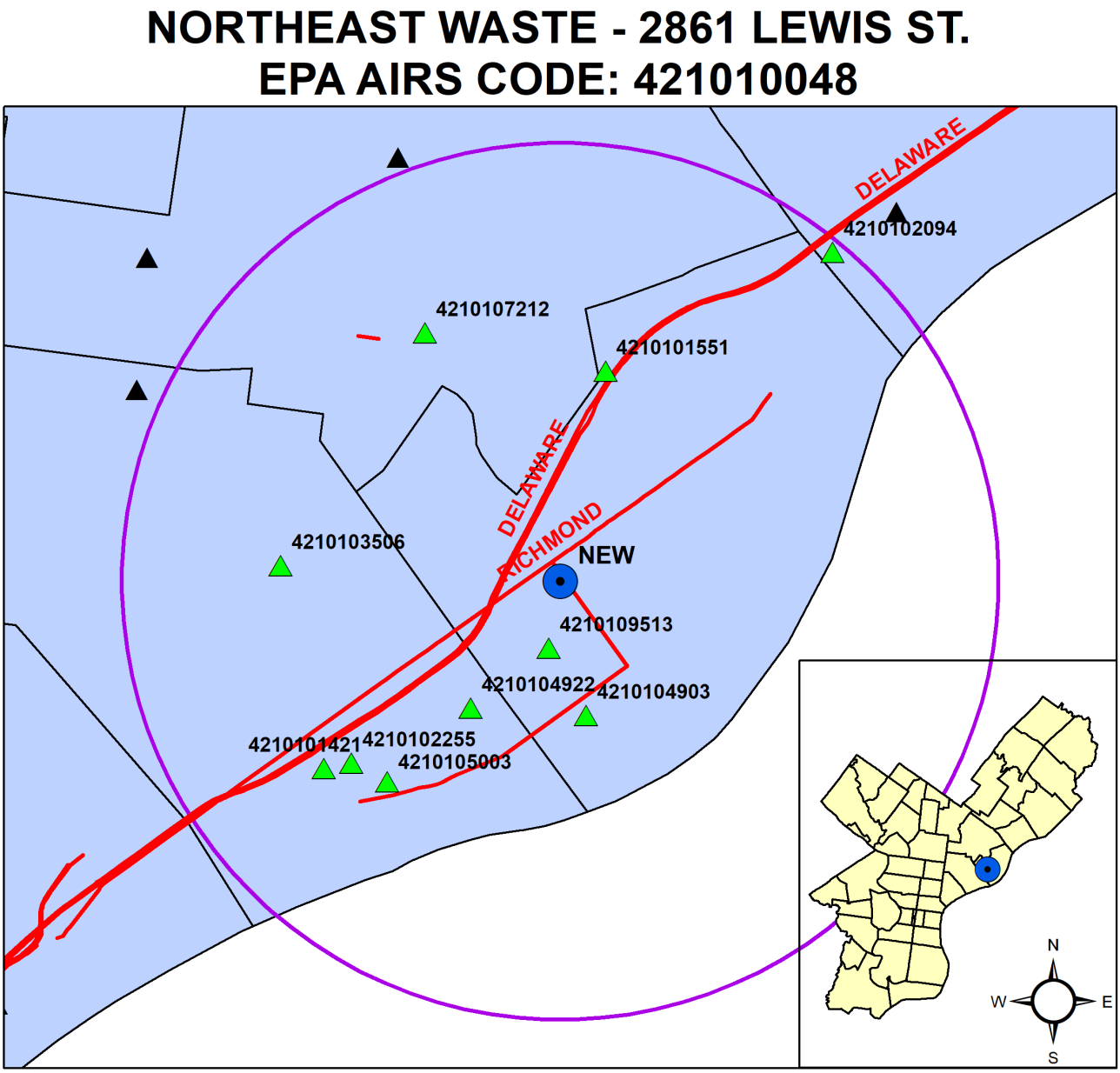
Table 5 – Detailed NEW information with Monitoring Station Picture

AMS SITE ID: NEW
AQS Site ID: 421010048
Street Address: 2861 Lewis Street
Geographical Coordinates
Latitude: 39.991389
Longitude: -75.080833

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
CO (trace)	SLAMS	NCORE	Continuous	Instrumental	Gas Filter Correlation CO Analyzer	High sensitivity	42101	1	093	Neighborhood	Population Exposure	2	10/2/2013
SO2 (trace)	SLAMS	NCORE	Continuous	Instrumental	Ultraviolet Fluorescence	High sensitivity	42401	2	100	Neighborhood	Population Exposure	2	10/2/2013
Ozone	SLAMS	NCORE	Continuous	Instrumental	Ultraviolet Absorption	Year-round operation	44201	1	087	Neighborhood	Population Exposure	2	10/2/2013
NO	SLAMS	NCORE	Continuous	Instrumental	Chemiluminescence Teledyne	High sensitivity external converter mounted at 10m	42601	1	099	Neighborhood	Population Exposure	10	10/2/2013
NOy	SLAMS	NCORE	Continuous	Instrumental	Chemiluminescence Teledyne	High sensitivity external converter mounted at 10m	42600	1	699	Neighborhood	Population Exposure	10	10/2/2013
PM10 Continuous	SLAMS	NCORE	Continuous	Teledyne API T640X at 16.67 LPM	Broadband Spectroscopy		81102	2	239	Neighborhood	Population Exposure	2	1/1/2019
PM2.5 Continuous	SLAMS	NCORE	Continuous	Teledyne API T640 at 5.00 LPM	Broadband Spectroscopy		88101	5	236	Neighborhood	Population Exposure	2	8/19/2020
PM2.5 Continuous	SLAMS	NCORE	Continuous	Teledyne API T640X at 16.67 LPM	Broadband Spectroscopy		88101	4	238	Neighborhood	Population Exposure	2	1/1/2020
PM2.5 Speciated	SLAMS	NCORE, CSN	1/3 days	Met One SASS (Nylon and Teflon) and URG	Energy Dispersive XRF, Ion Chromatography and IMPROVE	Analysis by EPA	Vary	5	Vary	Neighborhood	Population Exposure	2	10/2/2013
PM2.5 FRM	SLAMS	NCORE	1/3 days	R&P PM2.5	Gravimetric	NEW-D	88101	1	145	Neighborhood	Population Exposure	2	10/2/2013
PM10-2.5 (PM Coarse)	SLAMS	NCORE	Continuous	Teledyne API T640X at 16.67 LPM	Broadband Spectroscopy		86101	4	240	Neighborhood	Population Exposure	2	1/1/2019
Meteorological	SLAMS	NCORE	Continuous		Air quality measurements approved instrumentation for wind speed, wind direction, humidity,		Vary	1	Vary	Neighborhood	Population Exposure	10	6/1/1993

					barometric pressure, rainfall, and solar radiation								
Carbonyls	Other	Urban Air Toxics	1/6 days	DNPH-Coated Cartridges	HPLC	In addition to the 1-in-6 days UAT sampling, also sampling for three of 8-hour periods every 3rd day during PAMS season (June 1 - Aug 31)	Vary	1,3	102	Neighborhood	Population Exposure	7	10/14/2016
Toxics	Other	Urban Air Toxics	1/6 days	Canister Subambient Pressure	Multi-Detector GC		Vary	1,2	150	Neighborhood	Population Exposure	7	10/14/2016
PAMS VOC	SLAMS	PAMS	Continuous	CAS Auto GC		Year-round operation	Vary			Neighborhood	Population Exposure	5	6/1/2021
Ceilometer	SLAMS	PAMS	Continuous	Vaisala									1/1/2018
Solar radiation	SLAMS	PAMS	Continuous	MetOne									
UV radiation	SLAMS	PAMS	Continuous	Eppley									
Precipitation	SLAMS	PAMS	Continuous	MetOne									
True NO2	SLAMS	PAMS	Continuous	Teledyne Model T500U	Cavity Attenuated Phase Shift Spectroscopy		42602	1	212	Neighborhood	Population Exposure		4/1/2019

Figure 8 – NEW Monitoring Site Map with Major Streets and Major Emission Sources



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210105003	KINDER MORGAN LIQUIDS TERM/PHILA	3300 N DELAWARE AVE	0.000	4.765	5.172	0.369	0.285	0.080	17.535
4210101421	RIVERSIDE MATERIALS INC/ASPHALT PLT	2870 E ALLEGHENY AVE	0.000	22.080	4.610	2.240	0.890	0.560	7.970
4210102255	SMITH EDWARDS DUNLAP CO/ALLEGHENY AVE	2867 E ALLEGHENY AVE	0.000	0.142	0.172	0.013	0.000	0.033	3.194
4210104903	EXELON GENERATING CO/RICHMOND	3901 N DELAWARE AVE	0.000	0.019	3.230	0.110	0.022	0.239	0.002
4210104922	PHILA GAS WORKS/RICHMOND PLT	3100 E VENANGO ST	0.000	2.820	4.756	0.293	0.254	0.032	0.231
4210109513	NORTHEAST WPCP/PHILA	3899 RICHMOND ST	0.000	5.313	4.920	3.951	3.951	0.469	5.633
4210103506	PTR BALER AND COMPACTOR/PHILA	2207 E ONTARIO ST	0.000	0.388	0.484	0.038	0.038	0.048	21.685
4210101551	ADVANSIX INC	4700 BERMUDA ST	0.000	84.476	270.547	68.671	55.319	60.663	104.475
4210107212	DOMESTIC LINEN SUPPLY CO INC/PHILADELPHIA	4100 FRANKFORD AVE	0.000	0.893	1.066	1.009	1.009	0.007	19.050
4210102094	DIETZ & WATSON INC/PHILA	5701 TACONY ST	0.000	5.937	3.692	0.554	0.543	0.168	0.398

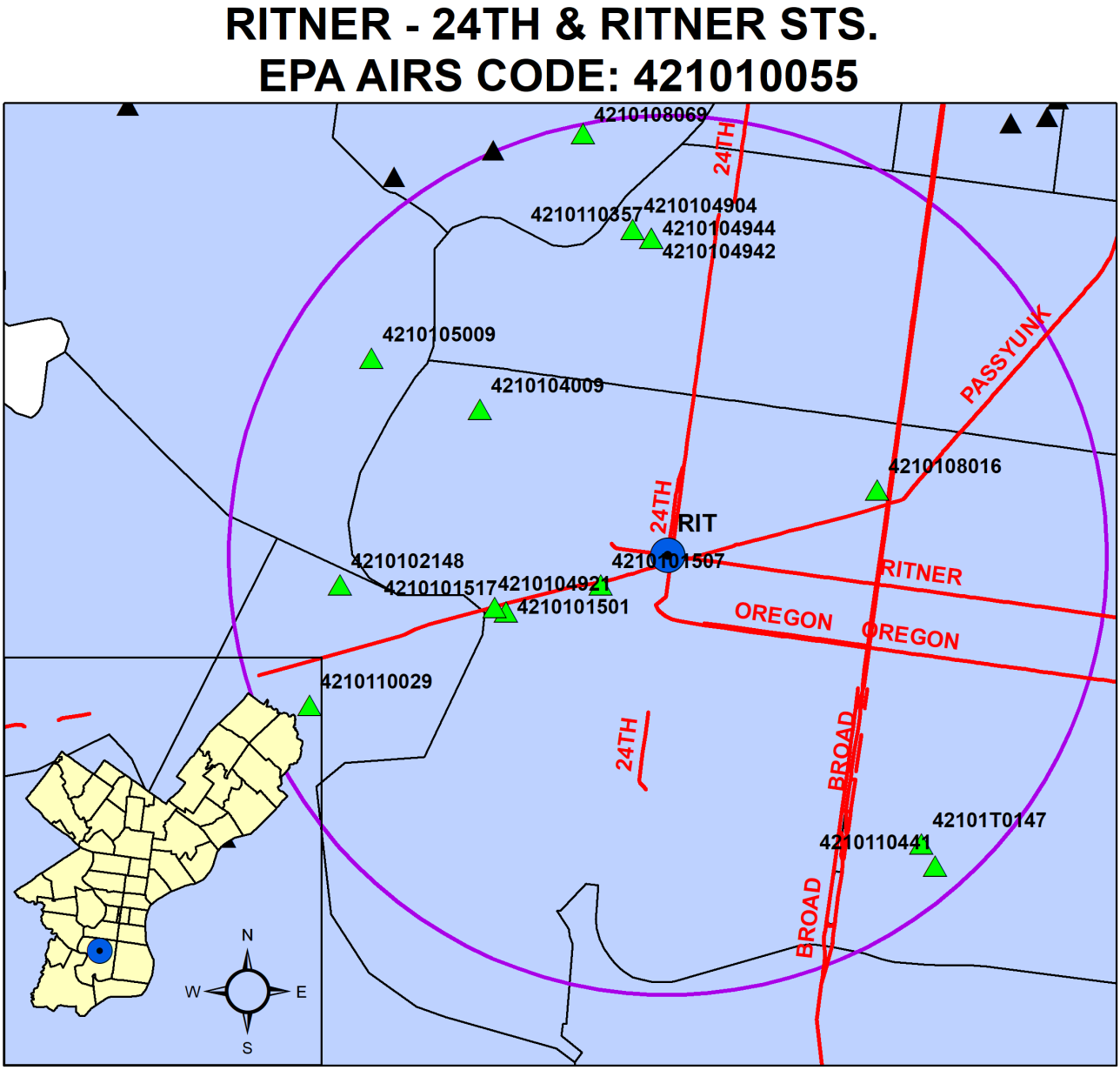
Figure 9 – NEW North Aerial View

Table 6 – Detailed RIT Information with Monitoring Station Picture

AMS SITE ID: RIT
AQS Site ID: 421010055
Street Address: 24th & Ritner Streets
Geographical Coordinates
Latitude: 39.922867
Longitude: -75.186921

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
SO2	SLAMS		Continuous	Instrumental	Ultraviolet Fluorescence		42401	1	100	Neighborhood	Population Exposure	4	11/9/2004
PM2.5 Speciated	SLAMS	CSN	1/3 days	Met One SASS (Nylon and Teflon) and URG	Energy Dispersive XRF, Ion Chromatography and IMPROVE	Analysis by EPA	Vary	5	Vary	Neighborhood	Population Exposure	2	9/1/2005
Metals	Other		1/6 days	Hi-Vol	ICP-MS	Analysis by WV (TSP sampler with quartz)	Vary	1	089	Neighborhood	Population Exposure	4	8/31/2004
Carbonyls	Other	Urban Air Toxics	1/6 days	DNPH-Coated Cartridges	HPLC		Vary	2	102	Neighborhood	Population Exposure	4	Vary
Toxics	Other	Urban Air Toxics	1/6 days	Canister Subambient Pressure	Multi-Detector GC		Vary	4,5	150	Neighborhood	Population Exposure	4	11/1/2004
PM2.5 Continuous	SLAMS		Continuous	Teledyne T640 at 5.0 LPM	Broadband Spectroscopy		88101	2	236	Neighborhood	Population Exposure	4	4/1/2020

Figure 10 – RIT Monitoring Site Map with Major Streets and Major Emission Sources



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210110441	LINCOLN FINANCIAL FIELD	1 LINCOLN FINANCIAL FIELD WAY	0.000	1.274	2.686	0.120	0.120	0.011	0.147
42101T0147	CITIZENS BANK PARK/PHILA	1001 PATTISON AVE	0.000	2.470	2.840	0.210	0.210	0.021	0.170
4210110029	KINDER MORGAN POINT BREEZE TERM/ PHILA	6310 PASSYUNK AVE	0.000	0.127	0.151	0.012	0.012	0.001	16.858
4210101501	PHILA ENERGY SOL REF/ PES	3144 W PASSYUNK AVE	0.008	373.252	581.274	63.383	63.383	65.846	575.338
4210101517	PES/SCHUYLKILL TANK FARM	3144 W PASSYUNK AVE	0.000	1.163	0.435	0.019	0.019	0.019	81.482
4210104921	PHILA GAS WORKS/PASSYUNK PLT	3100 W PASSYUNK AVE	0.000	2.228	3.117	0.262	0.206	0.092	0.358
4210101507	SUNOCO LOGISTICS/BELMONT TERM	2700 W PASSYUNK AVE	0.000	8.830	3.540	0.000	0.000	0.036	13.190
4210102148	CLEAN EARTH OF PHILA LLC/PHILA	3201 S 61ST ST	0.000	0.000	0.000	0.150	0.020	0.000	1.950
4210108016	CONSTITUTION HEALTH PLAZA / PHILA	1930 S BROAD ST	0.000	0.360	0.554	0.023	0.019	0.014	0.030
4210104009	TRANSFLO TERMINAL SERVICES INC/PHIL	3600 MOORE ST	0.000	0.022	0.089	0.404	0.007	0.001	0.042
4210105009	PBF LOGISTICS TERM 51ST/PHILA	1630 S 51ST ST	0.000	0.000	0.000	0.000	0.000	0.000	1.407
4210104942	VICINITY ENERGY SCHUYLKILL STATION	2600 CHRISTIAN ST	0.000	3.250	58.100	0.790	0.790	1.550	0.450
4210104944	GRAYS FERRY COGEN PARTNERSHIP/PHILA	2600 CHRISTIAN ST	0.001	18.410	223.400	15.080	15.080	3.700	0.600
4210110357	VICINITY ENERGY EFFICIENCY	2600 CHRISTIAN ST	0.000	0.040	2.900	0.300	0.300	0.150	1.380
4210104904	EXELON GENERATION CO/SCHUYLKILL STA	2800 CHRISTIAN ST	0.000	0.427	3.281	0.170	0.019	0.006	0.014
4210108069	CHILDRENS HOSP OF PHILA/ PHILA	34TH & CIVIC CENTER BLVD	0.000	14.119	27.485	2.963	2.963	0.929	2.738

Figure 11 – RIT North Aerial View

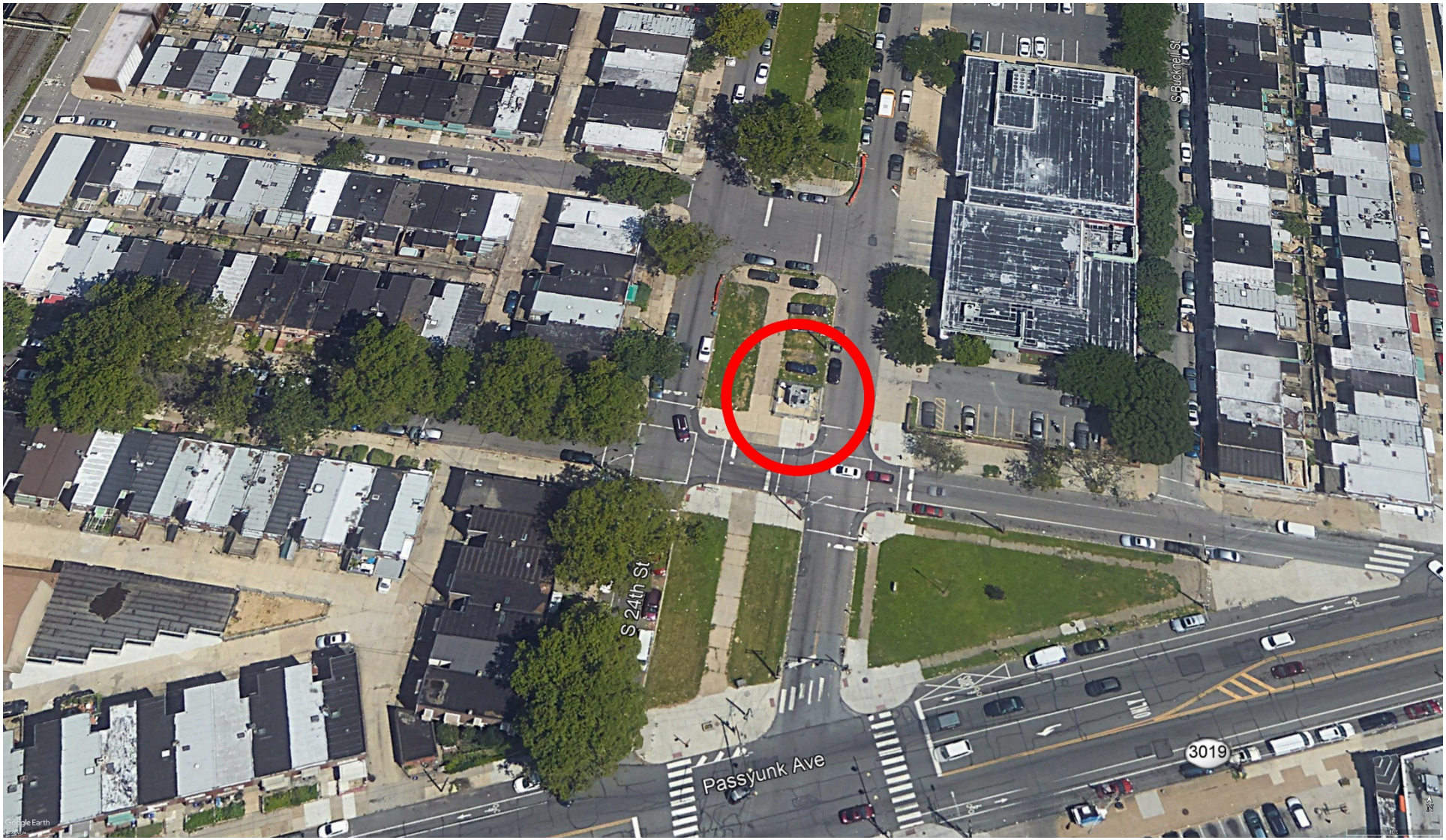
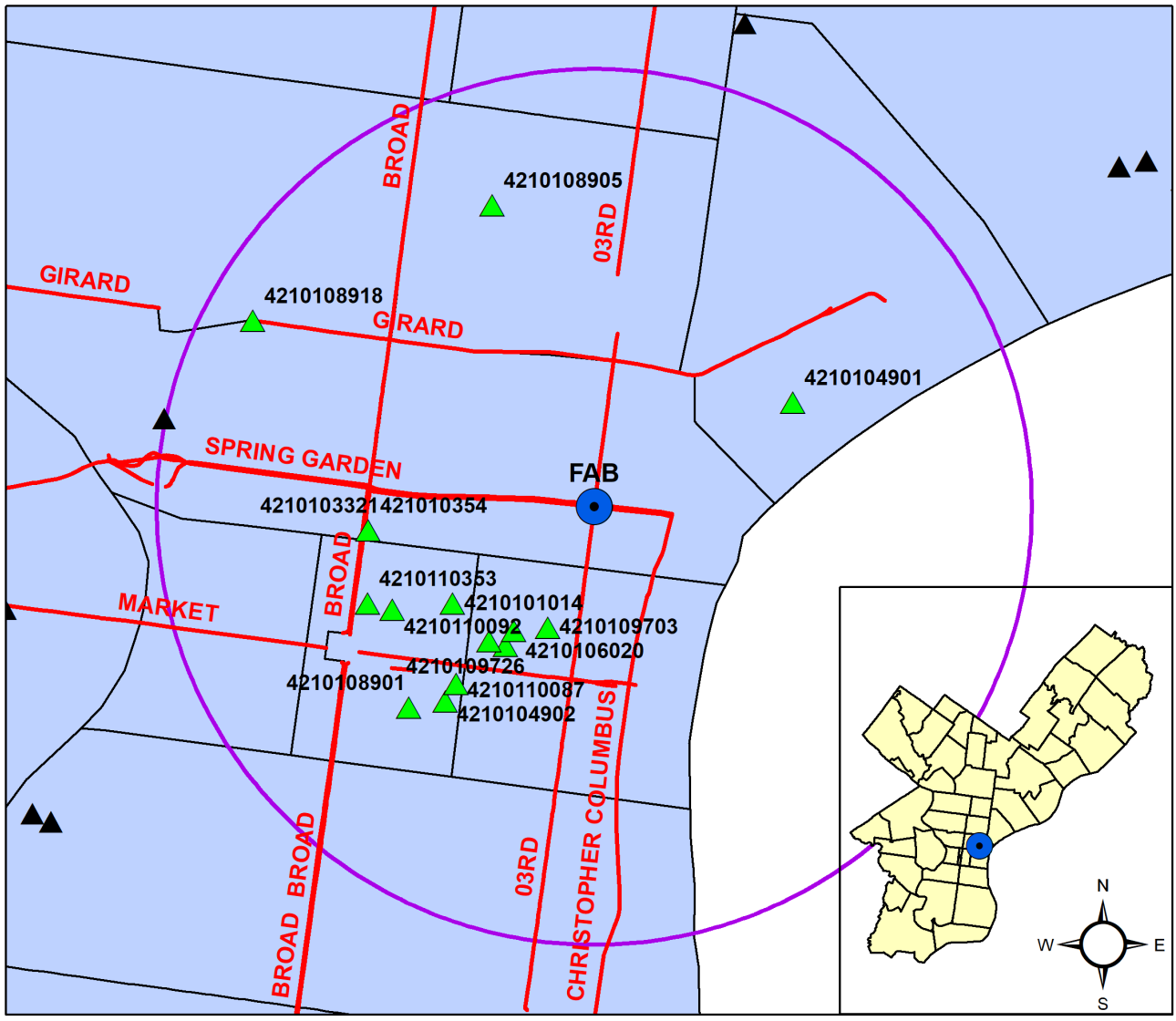


Table 7 – Detailed FAB Information with Monitoring Station Picture

AMS SITE ID: FAB
AQS Site ID: 421010057
Street Address: 3rd and Spring Garden Sts.
Geographical Coordinates
Latitude: 39.960048
Longitude: -75.142614

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
PM2.5 Continuous	SLAMS		Continuous	Teledyne T640 at 5.0 LPM	Broadband Spectroscopy		88101	2	236	Neighborhood	Highest Concentration	2	1/1/2020

Figure 12 – FAB Monitoring Site Map with Major Streets and Major Emission Sources



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210108901	THOMAS JEFFERSON UNIV/PHILA	11 & WALNUT ST	0.000	0.516	2.501	0.169	0.169	0.156	0.127
4210104902	VICINITY ENERGY EDISON STATION	908 SANSOM ST	0.000	1.732	17.209	2.911	1.535	26.590	0.099
4210110087	HCP INC/PHIL	833 CHESTNUT ST	0.000	0.733	0.969	0.025	0.025	0.014	0.045
4210109723	WILLIAM J GREEN JR FED BLDG/GSA	600 ARCH ST	0.000	2.650	3.990	0.240	0.240	0.050	0.190
4210109726	FEDERAL BUR OF PRISONS/ PHILA COURT	700 ARCH ST	0.000	1.115	1.394	0.527	0.000	0.014	0.077
4210106020	FEDERAL RESERVE BANK/PHILA	100 N 6TH ST	0.000	1.893	2.524	0.190	0.190	0.043	0.138
4210109703	US MINT/PHILA	151 N INDEPENDENCE MALL E	0.000	4.192	2.892	0.088	0.000	0.019	1.393
4210110092	PA CONV CTR/ARCH ST	1101 ARCH ST	0.000	1.905	2.659	0.100	0.093	0.040	0.138
4210101014	VERIZON MKT CTRL OFC/RACE ST	900 RACE ST	0.000	0.172	1.470	0.133	0.022	0.124	0.100
4210110353	PA CONVENTION CTR ANNEX/BROAD ST	111 N BROAD ST	0.002	0.813	1.566	0.080	0.080	0.056	0.083
4210103321	SUNGARD RECOVERY SVC INC/BROAD ST PHILA	401 N BROAD ST STE 600	0.000	0.015	0.039	0.002	0.000	0.000	0.002
421010354	CROSS CONNECT/PHILADELPHIA	401 N BROAD ST	0.000	0.015	0.076	0.004	0.000	0.000	0.004
4210104901	EXELON GENERATION CO/DELAWARE STA	1325 N BEACH ST	0.000	0.377	2.689	0.171	0.016	0.045	0.013
4210108918	GIRARD COLL/BOARDING SCH	GIRARD & CORINTHIAN AVE	0.000	2.355	2.808	0.213	0.213	0.017	0.154
4210108905	TEMPLE UNIV/ MAIN CAMPUS	1009 W MONTGOMERY AVE	0.000	16.340	24.190	2.700	2.699	0.330	3.663

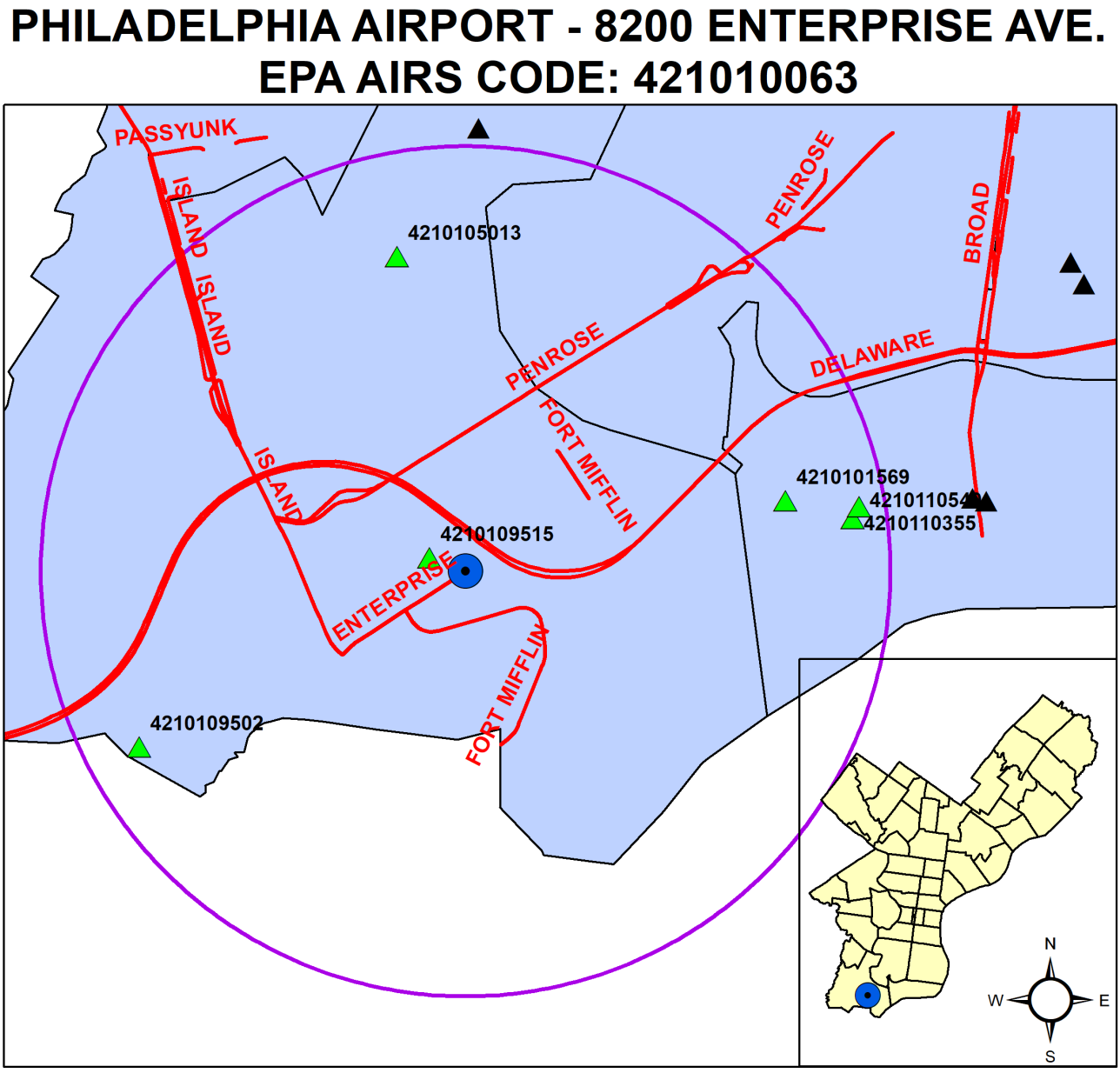
Figure 13 – FAB North Aerial View

Table 8 – Detailed SWA Information with Monitoring Station Picture

AMS SITE ID: SWA
AQS Site ID: 421010063
Street Address: 8200 Enterprise Avenue, 19153
Geographical Coordinates
Latitude: 39.88294
Longitude: -75.21965

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
Carbonyls	Other	Urban Air Toxics	1/6 days	DNPH-Coated Cartridges	HPLC		Vary	2	102	Neighborhood	Source-Oriented	4	9/10/2009
Toxics	Other	Urban Air Toxics	1/6 days	Canister Subambient Pressure	Multi-Detector GC		Vary	3,5	150	Neighborhood	Source-Oriented	4	9/10/2009

Figure 14 – SWA Monitoring Site Map with Major Streets and Major Emission Sources



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210109502	PHILA INTL AIRPORT/PHILA	INDUSTRIAL HWY	0.000	6.791	14.255	1.387	1.387	0.102	0.879
4210109515	PHILA WATER DEPT/STP SW	8200 ENTERPRISE AVE	0.000	9.285	4.192	0.978	0.978	0.771	3.090
4210110355	PHILA SHIP REPAIR/PHILA	5195 S 19TH ST	0.000	4.094	18.918	2.308	0.000	0.007	8.714
4210110540	NAVY YARD PEAKER STATION	1901 KITTY HAWK AVE	0.000	6.140	3.200	0.001	0.001	0.009	2.540
4210101569	PHILLY SHIPYARD INC / PHILA	PHILA NAVAL BUS CTR	0.000	0.024	0.014	7.295	6.707	0.000	11.547
4210105013	PBF LOGISTICS TERM 67TH ST/PHILA	6850 ESSINGTON AVE	0.000	1.293	1.539	0.113	0.113	0.010	52.915

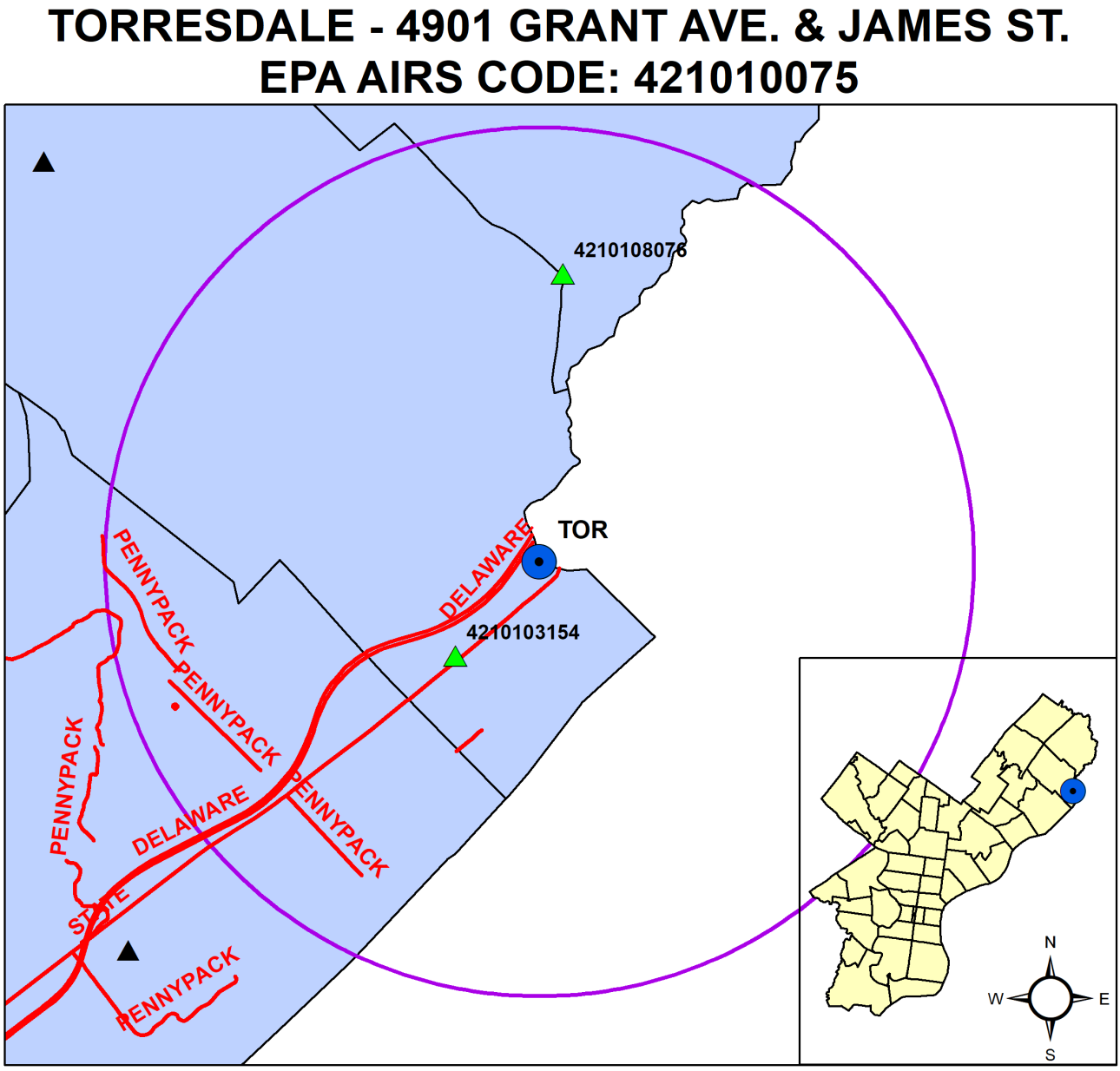
Figure 15 – SWA North Aerial View

Table 9 – Detailed TOR Information with Station Monitoring Picture

AMS SITE ID: TOR
AQS Site ID: 421010075
Street Address: 4901 Grant Ave. & James St., 19114
Geographical Coordinates
Latitude: 40.054171
Longitude: -74.985166

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
CO	SLAMS	Near Road	Continuous	Instrumental	Gas Filter Correlation CO Analyzer		42101	1	093	Microscale	Highest Concentration, Source Oriented	5	1/1/2014
NO2	SLAMS	Near Road	Continuous	Instrumental	Gas Phase Chemiluminescence		42602	1	099	Microscale	Highest Concentration, Source Oriented	5	1/1/2014
NO	SLAMS	Near Road	Continuous	Instrumental	Gas Phase Chemiluminescence		42601	1	099	Microscale	Highest Concentration, Source Oriented	5	1/1/2014
NOx	SLAMS	Near Road	Continuous	Instrumental	Gas Phase Chemiluminescence		42603	1	099	Microscale	Highest Concentration, Source Oriented	5	1/1/2014
PM2.5 Continuous	SLAMS	Near Road	Continuous	Teledyne T640 at 5.0 LPM	Broadband Spectroscopy		88101	2	236	Microscale	Highest Concentration, Source Oriented	5	4/1/2020
Meteorological	SLAMS	Near Road	Continuous		Vaisala 435C RH/AT Sensor		Vary	1	Vary	Microscale	Highest Concentration, Source Oriented	5	1/1/2014

Figure 16 – TOR Monitoring Site Map with Major Streets and Major Emission Sources



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210103154	JOWITT AND RODGERS CO/STATE RD FAC	9400 STATE RD	0.000	0.036	0.180	0.020	0.014	0.001	8.949
4210108076	JEFFERSON TORRESDALE HOSPITAL	RED LION & KNIGHTS RD	0.000	7.301	10.344	0.521	0.000	0.122	0.807

Figure 17 – TOR North Aerial View

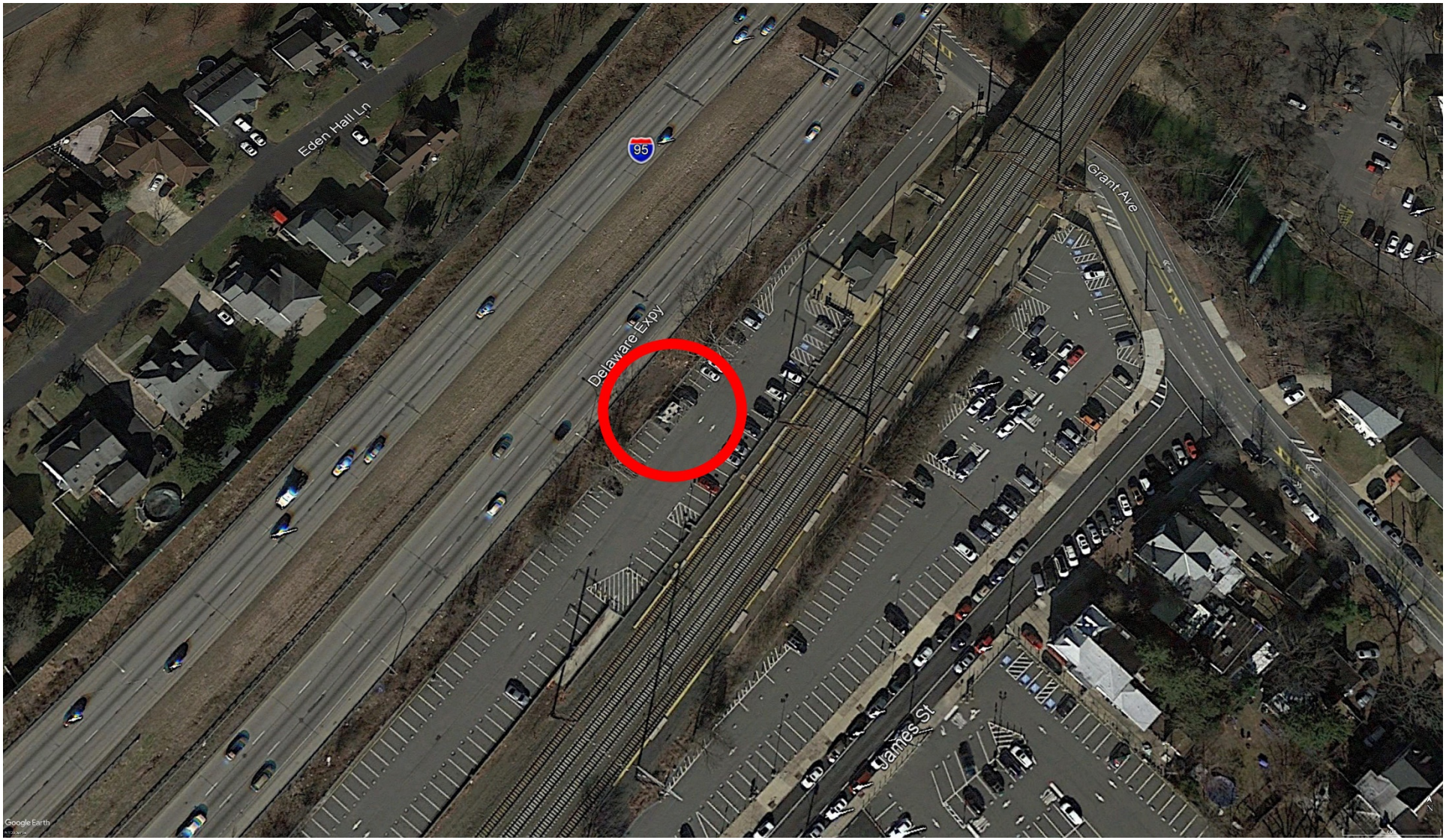


Table 10 Detailed MON Information with Monitoring Station Picture

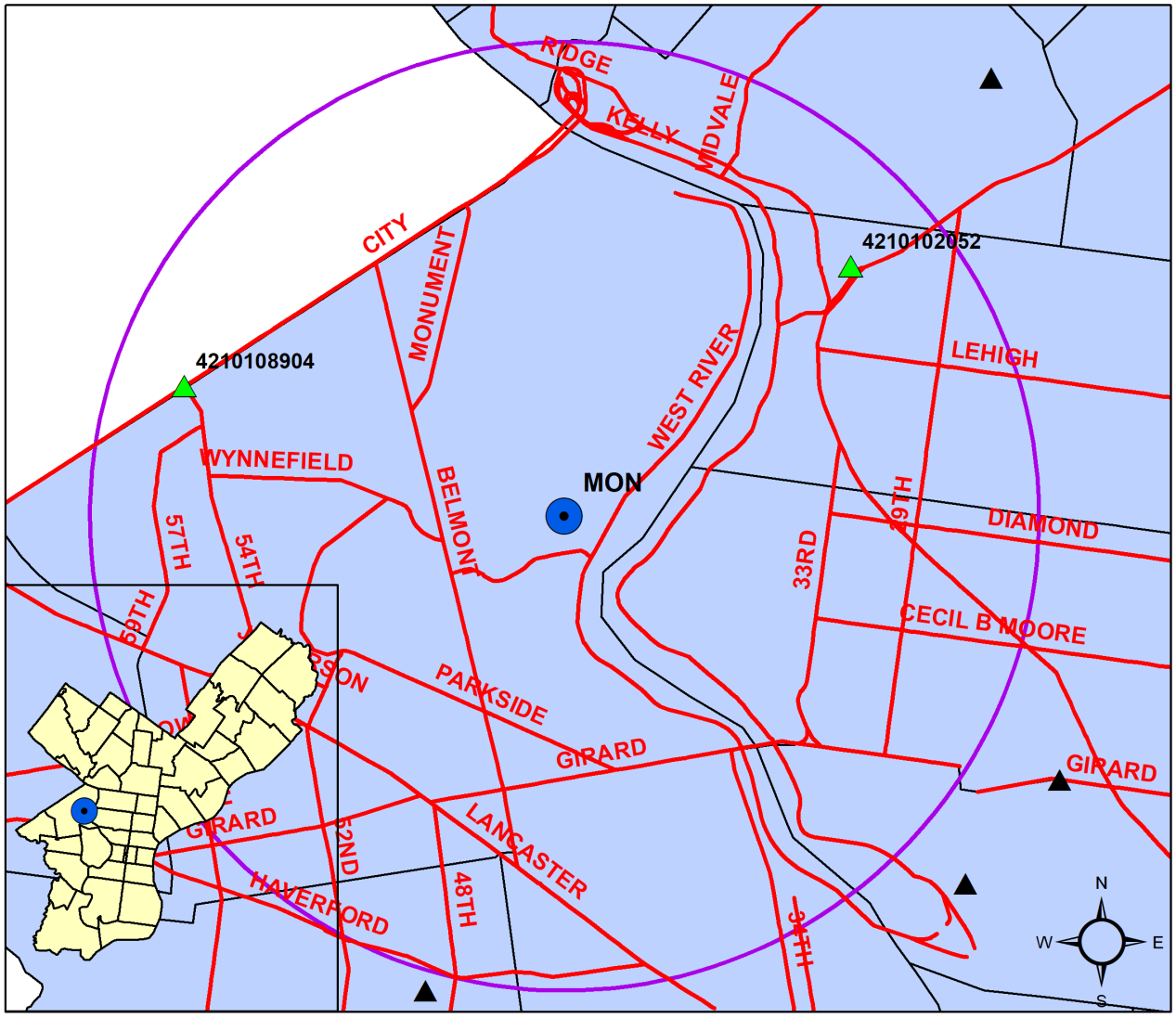
AMS SITE ID: MON
AQS Site ID: 421010076
Street Address: I-76 & Montgomery Drive, Car Barn OFM Shop 282
Geographical Coordinates
Latitude: 39.988842
Longitude: -75.207205

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
CO	SLAMS	Near Road	Continuous	Instrumental	Gas Filter Correlation CO Analyzer		42101	1	093	Microscale	Highest Concentration, Source Oriented	4	1/10/2017
NO2	SLAMS	Near Road	Continuous	Instrumental	Gas Phase Chemiluminescence		42602	1	099	Microscale	Highest Concentration, Source Oriented	4	7/1/2015
NO	SLAMS	Near Road	Continuous	Instrumental	Gas Phase Chemiluminescence		42601	1	099	Microscale	Highest Concentration, Source Oriented	4	7/1/2015
NOx	SLAMS	Near Road	Continuous	Instrumental	Gas Phase Chemiluminescence		42603	1	099	Microscale	Highest Concentration, Source Oriented	4	7/1/2015
PM2.5 Continuous	SLAMS	Near Road	Continuous	Teledyne T640 at 5.0 LPM	Broadband Spectroscopy		88101	2	236	Neighborhood	Highest Concentration, Source Oriented	4	6/1/2020
Black Carbon	SLAMS	Near Road	Continuous	Instrumental	Teledyne Model 633		88317	1	894	Microscale	Highest Concentration, Source Oriented	4	7/1/2015
Ultrafine Particulate	SLAMS	Near Road	Continuous	Instrumental	Teledyne Model 651		87101	1	173	Microscale	Highest Concentration, Source Oriented	4	7/1/2015

BaP	SLAMS	Near Road	1/6 days	Hi-Vol-SA/GMW-321-B	Gravimetric	Integrated samplers. Weighed by AMS. Analysis by Allegheny County, PA	17242	1	091	Microscale	Highest Concentration, Source Oriented	4	7/1/2015
Metals	Other	Near Road	1/6 days	Hi-Vol	ICP-MS	Analysis by WV (TSP sampler with quartz)	Vary	1	089	Neighborhood	Population Exposure	4	7/1/2015
Meteorological	SLAMS	Near Road	Continuous		Air quality measurements approved instrumentation for wind speed, wind direction, humidity, barometric pressure, rainfall, and solar radiation		Vary	1	Vary	Microscale	Highest Concentration, Source Oriented	4	7/1/2015

Figure 18 – MON Monitoring Site Map with Major Streets and Major Emission Sources

MONTGOMERY - INTERSTATE 76 & MONTGOMERY DR
EPA AIRS CODE: 421010076



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210108904	SAINT JOSEPHS UNIV/PHILA	54TH & CITY AVE	0.000	5.530	7.010	0.530	0.530	0.140	0.400
4210102052	SUN CHEM CORP/HUNTING PARK PLT	3301 W HUNTING PARK AVE	0.000	0.304	0.362	0.086	0.086	0.002	10.061

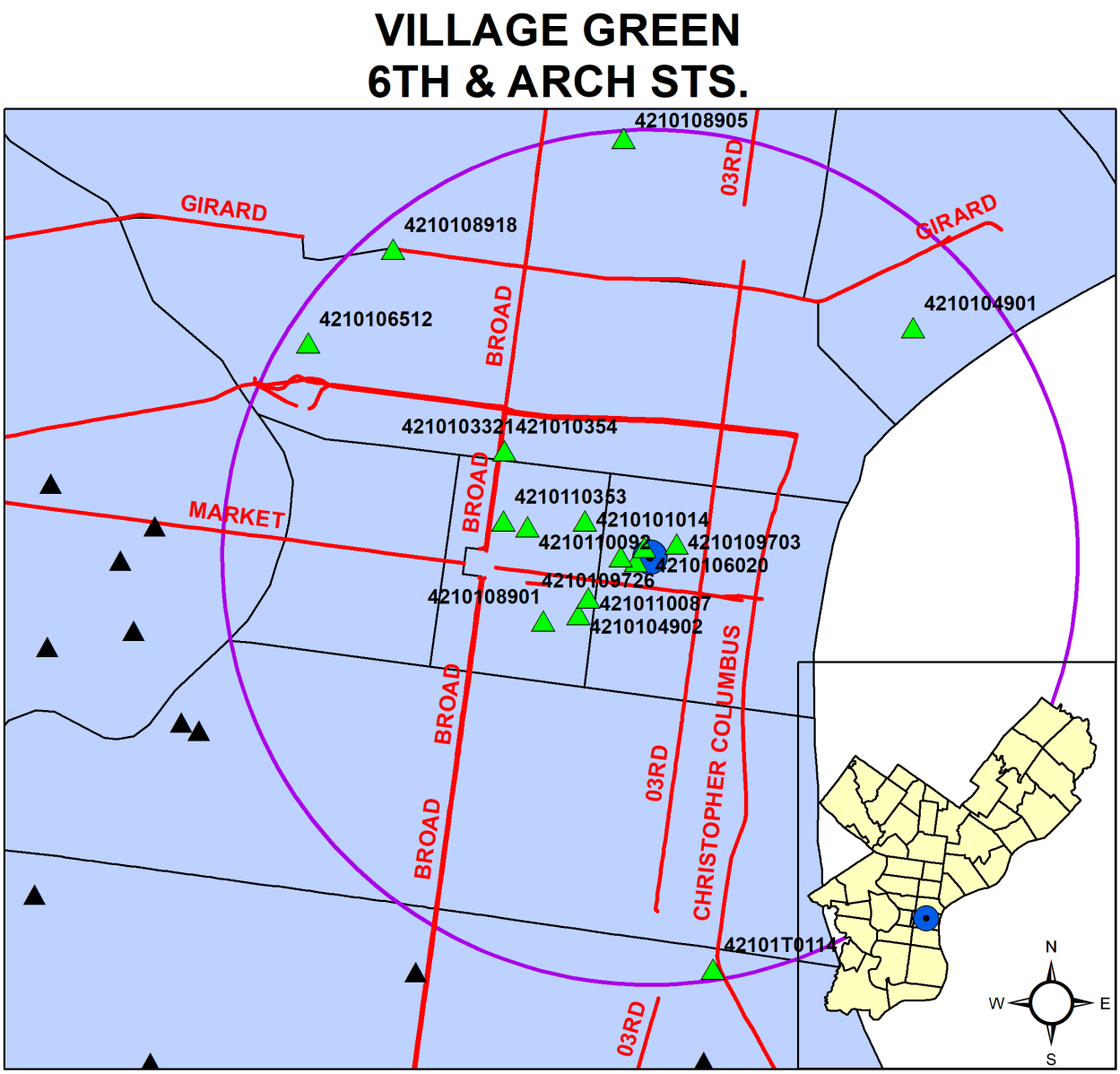
Figure 19 – MON North Aerial View

Table 11 – Detailed VGR Information with Monitoring Station Picture

AMS SITE ID: VGR
AQS Site ID:
Street Address: 6th & Arch Streets
Geographical Coordinates
Latitude: 39.952608
Longitude: -75.149704

Parameter	Monitoring Type	Monitor Network Affiliation	Operating Schedule	Collection Method	Analysis Method	Comments	Parameter Code	POC	AQS Method	Spatial Scale	Monitoring Objective	Probe Height (m)	Begin Date
Ozone			Continuous	2B Technologies		Not in AQS							3/15/2015
PM2.5 Continuous			Continuous	Thermo		Not in AQS							3/15/2015
Meteorological			Continuous		Wind speed, wind direction, humidity, temperature	Not in AQS							3/15/2015

Figure 20 – VGR Monitoring Site Map with Major Streets and Major Emission Sources



			2019 Emissions (tons)						
SiteID	Facility Name	Address	Pb	CO	NOX	PM10	PM2.5	SO2	VOC
42101T0114	COATING & CONVERTING TECH CORP/ADHESIVE COATING	80 E MORRIS ST	0.000	0.371	0.442	0.034	0.034	0.003	4.395
4210108901	THOMAS JEFFERSON UNIV/PHILA	11 & WALNUT ST	0.000	0.516	2.501	0.169	0.169	0.156	0.127
4210104902	VICINITY ENERGY EDISON STATION	908 SANSOM ST	0.000	1.732	17.209	2.911	1.535	26.590	0.099
4210110087	HCP INC/PHIL	833 CHESTNUT ST	0.000	0.733	0.969	0.025	0.025	0.014	0.045
4210109723	WILLIAM J GREEN JR FED BLDG/GSA	600 ARCH ST	0.000	2.650	3.990	0.240	0.240	0.050	0.190
4210109726	FEDERAL BUR OF PRISONS/ PHILA COURT	700 ARCH ST	0.000	1.115	1.394	0.527	0.000	0.014	0.077
4210106020	FEDERAL RESERVE BANK/PHILA	100 N 6TH ST	0.000	1.893	2.524	0.190	0.190	0.043	0.138
4210109703	US MINT/PHILA	151 N INDEPENDENCE MALL E	0.000	4.192	2.892	0.088	0.000	0.019	1.393
4210110092	PA CONV CTR/ARCH ST	1101 ARCH ST	0.000	1.905	2.659	0.100	0.093	0.040	0.138
4210101014	VERIZON MKT CTRL OFC/RACE ST	900 RACE ST	0.000	0.172	1.470	0.133	0.022	0.124	0.100
4210110353	PA CONVENTION CTR ANNEX/BROAD ST	111 N BROAD ST	0.002	0.813	1.566	0.080	0.080	0.056	0.083
4210103321	SUNGARD RECOVERY SVC INC/BROAD ST PHILA	401 N BROAD ST STE 600	0.000	0.015	0.039	0.002	0.000	0.000	0.002
421010354	CROSS CONNECT/PHILADELPHIA	401 N BROAD ST	0.000	0.015	0.076	0.004	0.000	0.000	0.004
4210104901	EXELON GENERATION CO/DELAWARE STA	1325 N BEACH ST	0.000	0.377	2.689	0.171	0.016	0.045	0.013
4210106512	PHILADELPHIAN CONDOMINIUMS/PHILA	2401 PENNSYLVANIA AVE	0.000	1.577	1.987	0.151	0.151	0.011	0.089
4210108918	GIRARD COLL/BOARDING SCH	GIRARD & CORINTHIAN AVE	0.000	2.355	2.808	0.213	0.213	0.017	0.154
4210108905	TEMPLE UNIV/ MAIN CAMPUS	1009 W MONTGOMERY AVE	0.000	16.340	24.190	2.700	2.699	0.330	3.663

Figure 21 – VGR North Aerial View

Appendix A
PAMS Implementation Network Plan

PAMS Monitoring Implementation Network Plan

Monitoring Organizations Required To Operate At NCore Sites

Philadelphia Air Management Services operates one Photochemical Assessment Monitoring Station (PAMS) site in the air monitoring network, at the NEW site, per the monitoring rule (80 FR 65292; October 26, 2015) which requires PAMS measurements June 1 through August 31 at NCore sites that are located in Core-Based Statistical Areas (CBSAs) with populations of 1,000,000 or more.

The main objective of the PAMS program is to develop a database of ozone precursors and meteorological measurements to support ozone model development and track the trends of important ozone precursor concentrations. The EPA and other scientists use the data collected from the PAMS network to develop, evaluate, and improve ozone models.

Per 85 FR 834; February 7, 2020, the EPA finalized a revision to the start date for the updated PAMS monitoring site network established in 40 CFR part 58, Appendix D. This final action extended the start date from June 1, 2019, to June 1, 2021, giving state and local air monitoring agencies two additional years to acquire the necessary equipment and expertise needed to successfully make the required PAMS measurements by the start of the 2021 PAMS season.

Network Decision

The NCore site located at NEW serves as the location of the required PAMS site and measures the following parameters described below. An Inventory of equipment used at the site(s) is provided in Attachment 2.

Auto GC Decision

Volatile organic compounds (VOCs) – A complete list of the targeted compounds are found in Table 1.

We will measure hourly speciated VOC concentrations with an auto-gas chromatograph (GC) using the Consolidated Analytical Systems (CAS).

Meteorology Measurements Decision

We will measure mixing height using the Vaisala CL51 Ceilometer.

Other Required Measurements

- **Carbonyls -** Carbonyl sampling at a frequency of three 8-hour samples on a one-in-three day basis (~90 samples per PAMS sampling season) using ATEC Sampler and Waters HPLC equipment for analysis. A complete list of the target carbonyl compounds may be found in Table 1. The TO-11A test method, as used in the National Air Toxics Trends (NATTS) program[4] will be used.

[4] See NATTS Technical Assistance Document for TO-11A method.

- **Nitrogen Oxides -** Will monitor for NO and NO_y (total oxides of nitrogen) in addition to true NO_2. The true NO_2 is required to be measured with a direct reading NO_2 analyzer, cavity attenuated phase shift (CAPS) spectroscopy or photolytic-converter NO_x analyzer. We will measure true NO2 using the Teledyne T500U. NO and NO_y will be measured using Teledyne instrumentation as well.

Table 1 PAMS Target Compound List

Priority Compounds				Optional Compounds			
1	1,2,3-trimethylbenzene [a]	19	n-hexane [b]	1	1,3,5-trimethylbenzene	19	m-diethlybenzene
2	1,2,4-trimethylbenzene [a]	20	n-pentane	2	1-pentene	20	methylcyclohexane
3	1-butene	21	o-ethyltoluene [a]	3	2,2-dimethylbutane	21	methylcyclopentane
4	2,2,4-trimethylpentane [b]	22	o-xylene [a,b]	4	2,3,4-trimethylpentane	22	n-decane
5	acetaldehyde [b,c]	23	p-ethyltoluene [a]	5	2,3-dimethylbutane	23	n-heptane
6	acetone [c,d]	24	Propane	6	2,3-dimethylpentane	24	n-nonane
7	benzene [a,b]	25	propylene	7	2,4-dimethylpentane	25	n-octane
8	c-2-butene	26	styrene [a,b]	8	2-methylheptane	26	n-propylbenzene [a]
9	ethane [d]	27	toluene [a,b]	9	2-methylhexane	27	n-undecane
10	ethylbenzene [a,b]	28	t-2-butene	10	2-methylpentane	28	p-diethylbenzene
11	Ethylene			11	3-methylheptane	29	t-2-pentene
12	formaldehyde [b,c]			12	3-methylhexane	30	α/β-pinene
13	Isobutane			13	3-methylpentane	31	1,3 butadiene [b]
14	Isopentane			14	Acetylene	32	benzaldehyde [c]
15	Isoprene			15	c-2-pentene	33	carbon tetrachloride [b]
16	m&p-xylenes [a,b]			16	cyclohexane	34	Ethanol
17	m-ethyltoluene [a]			17	cyclopentane	35	Tetrachloroethylene [b]
18	n-butane			18	isopropylbenzene [b]		

Source: Revisions to the Photochemical Assessment Monitoring Stations Compound Target List. U.S. EPA, November 20, 2013

[a] Important SOAP (Secondary Organic Aerosols Precursor) Compounds
[b] HAP (Hazardous Air Pollutant) Compounds
[c] Carbonyl compounds
[d] Non-reactive compounds, not considered to be VOC for regulatory purposes

Attachment 2 Equipment Inventory

Region	3
State	PA
Local	Philadelphia
AQS ID	42-101-0048
MSA	Philadelphia- Camden- Wilmington, PA-NJ-DE-MD

Parameter	Category	Detail
Agency	What is the monitoring agency name responsible for the PAMS Required Site?	Philadelphia Air Management Services
Site	PAMS Pollutant Site AQS ID (where auto-GC, carbonyls, NO2 are measured)	42-101-0048
	PAMS Meteorology Site AQS ID (for ceilometer, UV, solar measurements if not at pollutant site)	
	Are you operating a PAMS EMP site or sites? If so, please list	
Mixing Layer Height (MLH)	Is a ceilometer installed at the site or alternate meteorology site?	Yes
	Is an instrument type other than a ceilometer to be used for MLH?	No
	instrument type (ceilometer, radar profiler, etc)	Ceilometer
	manufacturer (e.g., Vaisala, Lufft)	Vaisala
	model (e.g., CL-51, CHM15k, CL-31)	CL-51
	date installed at site	1/1/2018
	MLH software (e.g., BL-View)	BL-View
	MLH software version	2.1.1.0
	Are ceilometer data sent to the UMBC ceilometer database?	Yes
	If ceilometer data are not sent to UMBC, why not? (e.g., IT will not allow, no ethernet at site)	
	comments (include problems, delays, difficulty, etc)	
Auto-GC	Is the auto-GC installed and operating (generating data)? If not, when is this anticipated?	19-Apr
	Auto-GC manufacturer/model	CAS-Chromatotec (FID)
	Is there a service contract for the auto-GC?	Yes
	Do you have a dynamic dilution system? If so, please list manufacturer and model	Yes, Entech 4700
	Zero air generator manufacturer/model - 1	CAS/AirmoCAL
	Zero air generator manufacturer/model - 2 (e.g., TOC generator)	
	Hydrogen generator manufacturer/model	CAS/Hydroxychrom
	Compressor manufacturer/model	
	Is the site reporting all priority compounds to AQS?	Yes
	Is the site reporting all optional compounds to AQS? If not, which are not reported and why?	It is our plan to report all optional compounds
	Do you have an operator chosen for the instrument? If yes, who?	Yes, Morgan K Robinson
	Please indicate your intended monitoring schedule: a. June 1 to August 31, b. year round, c. other (please indicate)	June 1 to August 31
	Have you determined the residence time to be less than or equal to 20 s?	yes

	Please indicate the method used to determine residence time (e.g. PAMS workgroup spreadsheet template or in-house spreadsheet)	PAMS workgroup spreadsheet template
	comments (include problems, delays, difficulty, etc)	
Data Acquisition System (DAS)	Will a DAS be used for PAMS pollutant and/or meteorology instruments?	Yes
	Pollutant DAS (manufacturer and model)	Agilaire 8872 AirVision
	Meteorology DAS (manufacturer and model)	Agilaire 8872 AirVision
	comments	
True NO_2 Measurement	Is a true NO2 instrument installed and operating?	Yes
	Instrument manufacturer and model	Teledyne T500U
	Gas calibrator manufacturer and model	Teledyne T700U
	What is the diluent mass flow controller range (e.g. 500 to 5000 cc/min)	0 to 20 LPM
	What is the standard gas mass flow controller range (e.g. 10 to 100 cc/min)?	CAL1: 0 to 200 cc/min CAL2: 0 to 20 cc/min
	What zero air generator (make/model) will support the instrument?	Teledyne T701H
	Method of NO2 calibration (GPT or NO2 standard gas dilution)	GPT
	What is the name/location of the gas supplier (e.g. Airgas, Cincinnati, OH)?	Praxair, Morrisville, PA
	comments (include problems, delays, difficulty, etc)	
NOy (total reactive nitrogen compounds) Measurement	Is an NOy instrument installed and operating?	Yes
	Instrument manufacturer and model	Teledyne 200U
	Gas calibrator manufacturer and model	Teledyne T700U
	What is the diluent mass flow controller range (e.g. 500 to 5000 cc/min)	0 to 20 LPM
	What is the standard gas mass flow controller range (e.g. 10 to 100 cc/min)?	CAL1: 0 to 200 cc/min CAL2: 0 to 20 cc/min
	What zero air generator (make/model) will support the instrument?	Teledyne T701H
	Method of NO/NO2 calibration (GPT or NO2 standard gas dilution)	GPT
	What is the name/location of the gas supplier (e.g. Airgas, Cincinnati, OH)?	Praxair, Morrisville, PA
	comments (include problems, delays, difficulty, etc)	
Carbonyls Sampling	Is an carbonyls sampler (capable of 3 consecutive 8-hour samples) installed and operating?	Yes
	Has the carbonyls sampler undergone zero certification and MFC calibration?	No
	Carbonyls sampler manufacturer and model	ATEC
	Flow transfer standard manufacturer and model	BIOS Definer 220-M
	Flow transfer standard calibration date	9/1/2021; 12/29/2021
	Do you intend to collect precision (duplicate and/or collocated samples - please indicate which)?	
	Do you have a continuous formaldehyde monitor installed or plan to purchase one?	No
	comments (include problems, delays, difficulty, etc)	
Carbonyls Analysis	Please identify the carbonyls analytical support laboratory	Philadelphia Air Management Services
	comments	
Temperature	Is a temperature probe installed and operating?	Yes
	Temperature probe manufacturer and model	Vaisala WXT 520
	comments	10 meter high

Relative Humidity	Is a relative humidity probe installed and operating?	Yes
	Relative humidity instrument manufacturer and model	Vaisala WXT 520
	comments	10 meter high
Barometric Pressure	Is a barometer (or equivalent barometric pressure instrument) installed and operating?	Yes
	Barometric pressure instrument manufacturer and model	Vaisala WXT520
	comments	
UV Radiation	Is a UV radiometer installed and operating?	Yes
	UV instrument manufacturer and model	Eppley TUVR
	comments	
Solar Radiation	Is a solar pyranometer/radiometer installed and operating?	Yes
	Solar instrument manufacturer and model	MetOne 094
	comments	
Precipitation	Is a precipitation gauge installed and operating?	Yes
	Precipitation gauge manufacturer and model	MetOne 375C
	comments	
Wind Speed/ Wind Direction	Is a wind speed/wind direction instrument array installed and operating?	Yes
	manufacturer(s)	Vaisala
	model(s)	WXT520
	comments	10 meter high

Appendix B
Philadelphia Air Quality Survey

Philadelphia Air Quality Survey Project Overview

Objectives

Although the City of Philadelphia has operated a network of EPA sponsored regulatory air monitoring stations for many years, the number of these stations is usually small, and the locations of the stations cannot reflect neighborhood level variances of air quality across the city. This project aims to fill the gap in air quality monitoring and achieve the following objectives:

1. Set up street-level, neighborhood-oriented air sampling sites throughout the city to sample the air for two years or more and capture seasonal changes and neighborhood-to-neighborhood spatial variances in air quality.
2. Measure air pollutants with significant health concerns, including $PM_{2.5}$, NO_2, ozone, SO_2, and black carbon.
3. Obtain quality assured data results that can serve as the basis for future work,including: provide policy recommendations to reduce pollution from congested city traffic, diesel vehicles and winter time fuel burning; analyze the relations between air quality and land use characters at neighborhood level; provide data for studying public health impact of air pollution in the city.

Project Design

Monitoring Sites: A grid of 300m x 300m cells was created over the city map using GIS tools for the purposes of site selection, data processing, and air quality modeling in the future. A sampling site falls in one of these cells. The entire city was divided into four quadrants (areas): Central, Northeast, Northwest, and South/Southwest. The Central quadrant was given larger number of sites and higher site density, considering the high density of population, traffic and buildings, and potentially larger gradients of pollutant concentration variances. Originally 50 monitoring sites were selected. About 65% of the sites were randomly selected using GIS mapping techniques to make the air sampling statistically representative. About 35% of the sites were determined as "purposeful" sites. Their locations were selected to serve one or more particular purposes. At each monitoring site, a portable sampling unit is mounted on an utility pole about 10 – 11 feet above the ground.

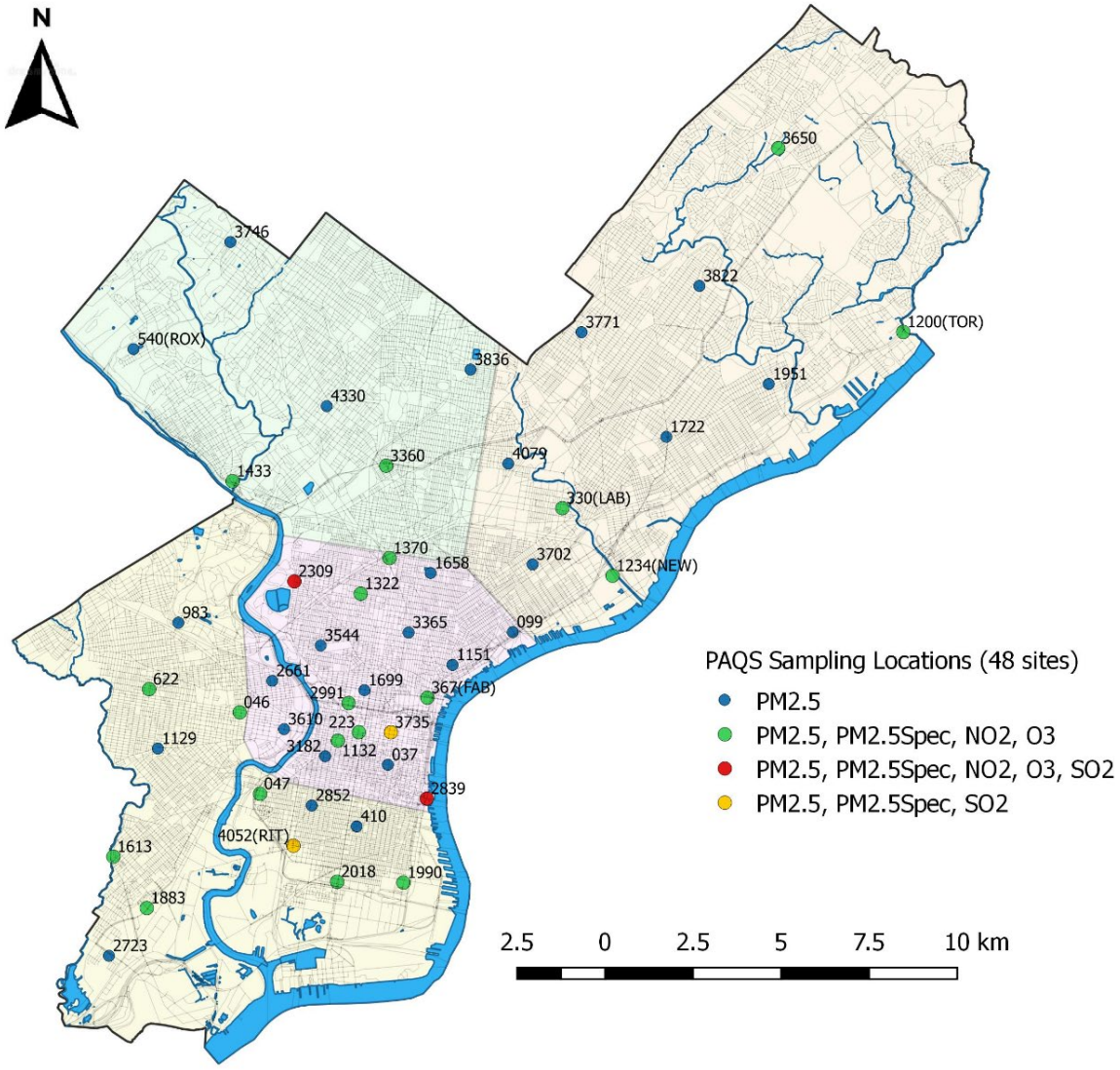
Sampling Unit: The sampling unit contains a filter based $PM_{2.5}$ sample collector. At some of the sites, the sampling unit also includes NO_2, SO_2, and/or O_3 passive samplers. The unit contains meteorological sensors as well and is powered by two batteries.

Sampling Operation: The sampling unit operates on 2-week sampling cycles. Four sites, known as "reference sites", are monitored with consecutive sampling periods throughout the year to provide a time series of pollutant concentrations. For the rest of the sites, sampling units are rotated to cover them in four operational sessions (2-week periods) during a season (a three-month period). In each session, the four reference sites plus 11 to 13 other sites are monitored. These 11 – 13 sites in each session are randomly selected across the city to avoid spatio-temporal confounding associated with different sites being monitored during different time windows.

Outputs

The air sampling operation started in May 2018 and is ongoing. The project outputs include measurements from the first ever citywide large scale street level air monitoring, demonstrating

spatial variance of pollutant concentrations across the city. A project report[5] based on the first two years' data has been produced. During the period from September 2018 through August 2019, the site with the highest 12-month average $PM_{2.5}$ concentration had a value of 10.1 µg/m^3 (in Center City); the lowest was 6.4 µg/m^3 (in Northwest Philadelphia); and the citywide all-sites 12-month average $PM_{2.5}$ concentration was 7.9 µg/m^3. Based on data analysis of the first two years' measurements, minor adjustments have been made in the monitoring site network in order to: 1) add sampling sites where local communities had significant air quality concerns but monitoring data were unavailable, and 2) discontinue sites where both the air pollution levels and the population density were relatively low. After these adjustments, the PAQS project maintains 48 sampling sites starting September 2020, as shown in the map below.



[5] https://www.phila.gov/media/20210316150355/PAQS_Report_Sept4-2020_final.pdf

Appendix C
2020 Community-Scale Air Toxics Ambient Monitoring Grant

2020 Community-Scale Air Toxics Ambient Monitoring Grant Project

Summary

In October 2020, AMS received an EPA grant award for Community-Scale Air Toxics Ambient Monitoring (RFP Number: EPA-OAR-OAQPS-20-05). This project will focus on monitoring the top seven air toxics in Philadelphia: formaldehyde, benzene, carbon tetrachloride, naphthalene, acetaldehyde, 1,3-butadiene, and ethylene oxide.

Monitoring will be conducted in 4 areas and 5 sampling sites. See attached map for proposed site locations. All proposed monitoring areas are Environmental Justice areas.

1. South Philly (at existing AMS RIT monitoring station)
2. South Philly, south of RIT, east of PES Refinery
3. Eastwick neighborhood
4. Center City
5. Reference site, West Philly

Rational

EPA's 2014 National Air Toxics Assessment (NATA) shows the above seven compounds contributed the most air toxics cancer risks in Philadelphia. The community surrounding the oil refinery complex in South Philadelphia has long been concerned about the impact of exposure to air toxics. This neighborhood has high poverty rates, lower-than-average education levels, and a large at-risk population. The Eastwick neighborhood is about 1.5 miles north of the Philadelphia International Airport and close to a Superfund site. According to a University of Pennsylvania study, a large percentage of residents in this neighborhood have complained about asthma and breathing problems. Also, parts of Center City are among the areas with the highest lifetime air toxics total cancer risks in Philadelphia.

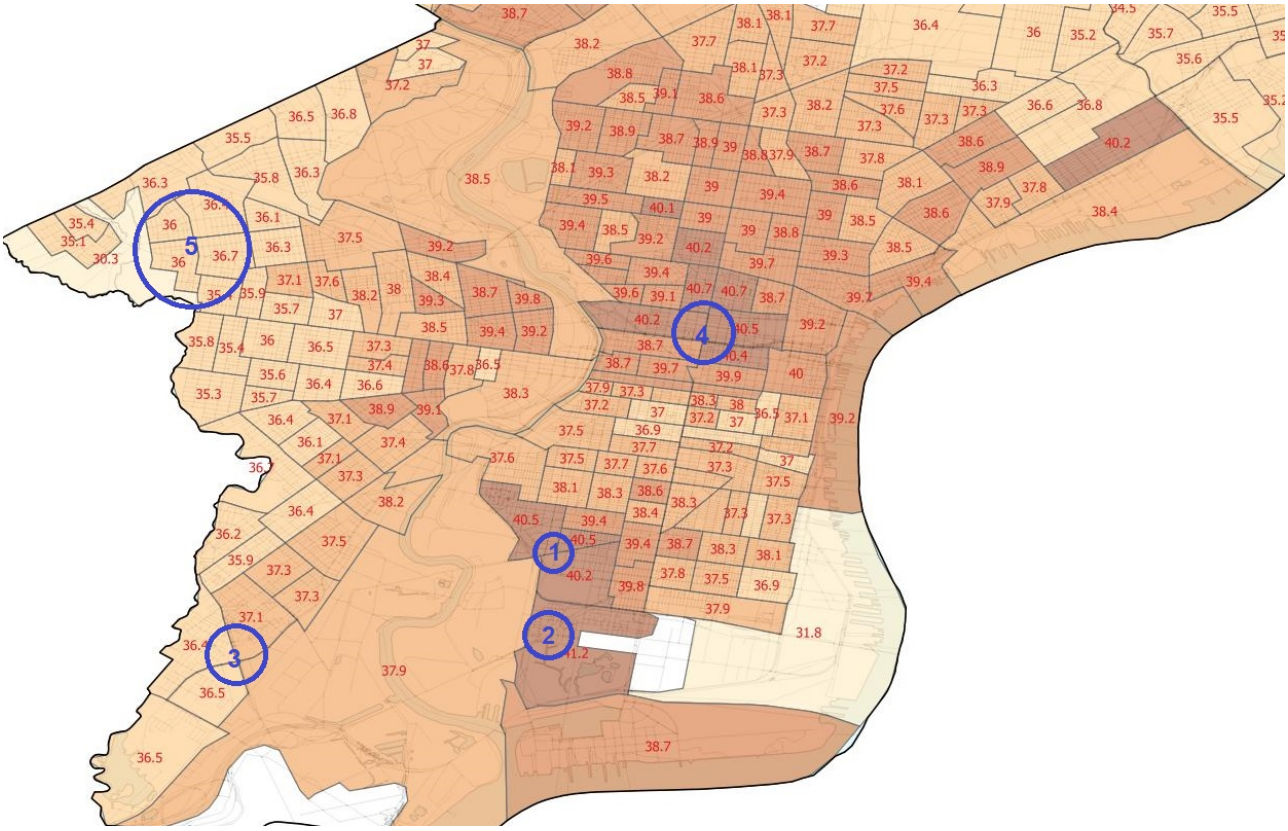
Methods

Passive samplers will be used to continuously measure the air toxics. The sampling period will last at least 12 months. A weather-proof sampler housing will be installed at a height about 3 meters above the ground at each site (as illustrated below). EPA designated analytical methods (GC/MS and uHPLC) will be used in sample analysis.

Project Timeline (2 years in total, 1 year of air sampling operation)

Activity	Nov – Dec 2020	Jan – Mar 2021	Apr – Jun 2021	Jul – Sep 2021	Oct – Dec 2021	Jan – Mar 2022	Apr – Jun 2022	Jul – Oct 2022
Equipment purchase and testing, training	X	X	X					
Preparation for sites and field sampling		X	X					
Sampling intensives			(may start in 2021Q2 pending equipment purchase)	X	X	X	X	
Data analysis / assessment					X	X	X	X
Preliminary assessment reports						X		
Final Report								X

Proposed Monitoring Locations:



(Numbers in red indicate estimated air toxics cancer risk (per million population) by census tract according to EPA 2014 NATA study)

Appendix D
Proof of Publication

Proof of Publication in The Philadelphia Daily News
Under Act. No 587, Approved May 16, 1929

STATE OF PENNSYLVANIA
COUNTY OF PHILADELPHIA

Helene Sweeney being duly sworn, deposes and says that **The Philadelphia Daily News** is a newspaper published daily, except Sunday, at Philadelphia, Pennsylvania, and was established in said city in 1925, since which date said newspaper has been regularly issued in said County, and that a copy of the printed notice of publication is attached hereto exactly as the same was printed and published in the regular editions and issues of the said newspaper on the following dates:

April 16, 2021

Affiant further deposes and says that she is an employee of the publisher of said newspaper and has been authorized to verify the foregoing statement and that she is not interested in the subject matter of the aforesaid notice of publication, and that all allegations in the foregoing statement as to time, place and character of publication are true.

Helene Sweeney

Sworn to and subscribed before me this 16th day of April, 2021.

Katherine V. Harley
Notary Public

My Commission Expires:

Commonwealth of Pennsylvania - Notary Seal
KATHERINE V. HARLEY, Notary Public
Philadelphia County
My Commission Expires May 25, 2021
Commission Number 1312020

Copy of Notice of Publication

PROPOSED ANNUAL MONITORING NETWORK PLAN FOR PHILADELPHIA

The Code of Federal Regulations (CFR) Title 40: Protection of Environment, Part 58: Ambient Air Quality Surveillance requires state and local air pollution control agencies to adopt and submit to the Environmental Protection Agency (EPA) Regional Administrator an Annual Monitoring Network Plan (AMNP) by July 1, 2021. The AMNP provides for the establishment and maintenance of an air quality surveillance system that consists of a network of monitoring stations. A proposed AMNP must be made available for public inspection and comment for at least 30 days prior to submission to EPA.

Air Management Services (AMS) is the local air pollution control agency for the City of Philadelphia under the Department of Public Health. Philadelphia has an air monitoring network of 10 air monitoring stations that house instruments that measure ambient levels of air pollutants.

The proposed AMNP is available for public inspection on the City's website at https://www.phila.gov/departments/air-pollution-control-board/air-management-notices/ and at the office of Air Management Services, 321 University Avenue, 2nd Floor, Philadelphia, PA 19104, during normal business hours. For further information, contact Mr. Jason Li, Engineering Supervisor of Program Services at (215) 685-9440.

Written comments on the proposed AMNP should be sent to Mr. Jason Li, Engineering Supervisor of Program Services, Air Management Services, 321 University Avenue, 2nd Floor, Philadelphia, PA 19104 or via email at jlazheng.li@phila.gov. Use "2021 Air Monitoring Network Plan" as the subject line in written communication. Only written comments will be accepted. Comments received by facsimile will not be accepted. Persons wishing to file comments on the proposed AMNP must submit comments by May 17, 2021.

Appendix E
Comment and Response Document

2021-2022 Air Monitoring Network Plan
Comment/Response Document

City of Philadelphia
Department of Public Health
Air Management Services (AMS)

June 25, 2021

Comment and Response Document
Concerning AMS' 2021-2022 Air Monitoring Network Plan

Overview

On April 16, 2021 and April 24, 2021, notices in the Philadelphia Daily News and the Pennsylvania Bulletin (51 Pa.B. 2355) were published concerning public inspection of AMS' 2021-2022 Air Monitoring Network Plan (Plan). The Plan outlines the air monitoring program history, provides an overview of the air monitoring network, and discusses in detail, monitoring sites, methods, and equipment. In addition, past and anticipated monitoring activities for a period of 18 months are addressed.

The Plan outlined several changes to AMS' air monitoring network:

- Establishing a PM2.5 monitor at LAB
- PAMS monitoring starting June 2021
- Addition of a PANDORA spectrometer in summer 2021
- Additional monitoring projects beyond the scope of SLAMs monitoring
    - Philadelphia Air Quality Survey
    - Community Scale Air Toxics monitoring project
    - Mobile monitoring station
    - Possible port monitoring project with EPA

Public Comment

Notice of the availability of the proposed Plan for public review and comment was published in the Philadelphia Daily News on April 16, 2021, and the Pennsylvania Bulletin on April 24, 2021. The public comment period on the proposed Plan was to close on May 17, 2021, but due to a printing error in the Pennsylvania Bulletin, the comment period was extended until May 24, 2021. Any comments received after the closing date were not considered but were identical to those received in group 1 or 2. Comments were received by 51 commentors, generating 7 distinct groups of comments. Comments and AMS' responses follow the list of commentors in this document.

Table 1. List of Commentors for AMS' 2021-2022 Air Monitoring Network Plan

Number	Commentor	Affiliation
1	Carl Gershenson Deborah McIlvaine Erika Morgan Eugene Gualtieri Frank Kohn Geneva Butz Hamil Pearsall Jack Byerly Jennifer Kraft	

	Jennifer Rovner Jessica Bellwoar Jill Turco Lori Braunstein Matthew Feldman Michael McQuown Roberta Camp Russell Zerbo Sheldon Isaac Teora Milson William Edelman	
2	Alex Bomstein Diane Fuchs Donna Cosgrove Elizabeth Lutes Heather Knizhnik Jack Braunstein Jack Schonewolf Jason Volpe Jessica Krow Justin Hess Karen Guarino Spanton Lynn Robinson Marielle Lerner Marisa Wilson Mary Allen Mary Ann Leitch Nancy Alderson Nina Coffin Richard Whiteford Rosa Zedek Sandy Brubaker Shawn Megill Legendre Sheila Erlbaum Susan Babbitt Will Fraser William Haegele	
3	Mordecai-Mark Mac Low	
4	James Mullison	Philly Thrive
5	Lynn Robinson	Neighbors Against the Gas Plants
6	Lisa Hastings	
7	Chris Ahlers	Clean Air Council

Comments and Responses

The comments are presented by commenter, in the order listed in Table 1. The identity of the commentator(s) is indicated by the commenter number in parentheses at the end of each comment. Department responses are bolded and follow each comment.

1. 20 Commentors commented that Philadelphia is out of attainment for ozone and PM2.5 (1)

Response: AMS appreciates the commenters' concerns regarding ozone and PM2.5 attainment levels in Philadelphia. However, Philadelphia has attained the National Ambient Air Quality Standard for PM2.5 since April 21, 2015 (See 80 FR 22112), and Philadelphia is in marginal non-attainment for ozone.

2. 49 Commentors commented on the implementation of Air Management Regulation X (AMR X) (1) (2) (3) (4) (6)

   Response: AMS appreciates the commenters' concerns regarding the implementation of Air Management Regulation X. AMR X is a congestion management tool and the implementation of AMR X is beyond the scope of this document.

3. 47 Commentors commented on expanding air monitoring to include new and existing sources of mobile source emissions. (1) (2) (3)

   Response: AMS appreciates the commenters' concerns regarding mobile pollutant sources. The current air monitoring network is designed to measure emissions from all sources, including mobile sources.

   In 2014, AMS established the 1st near road monitor at TOR and established a 2nd near road monitor at MON in 2015. These monitors target highly trafficked roads and the reason supporting them were documented in the 2013-2014 Plan and 2014-2015 Plan

4. Philly Thrive commented that they are pleased the United States Environmental Protection Agency (EPA) awarded AMS the Community Scale Air Toxics Grant in 2020. (4)

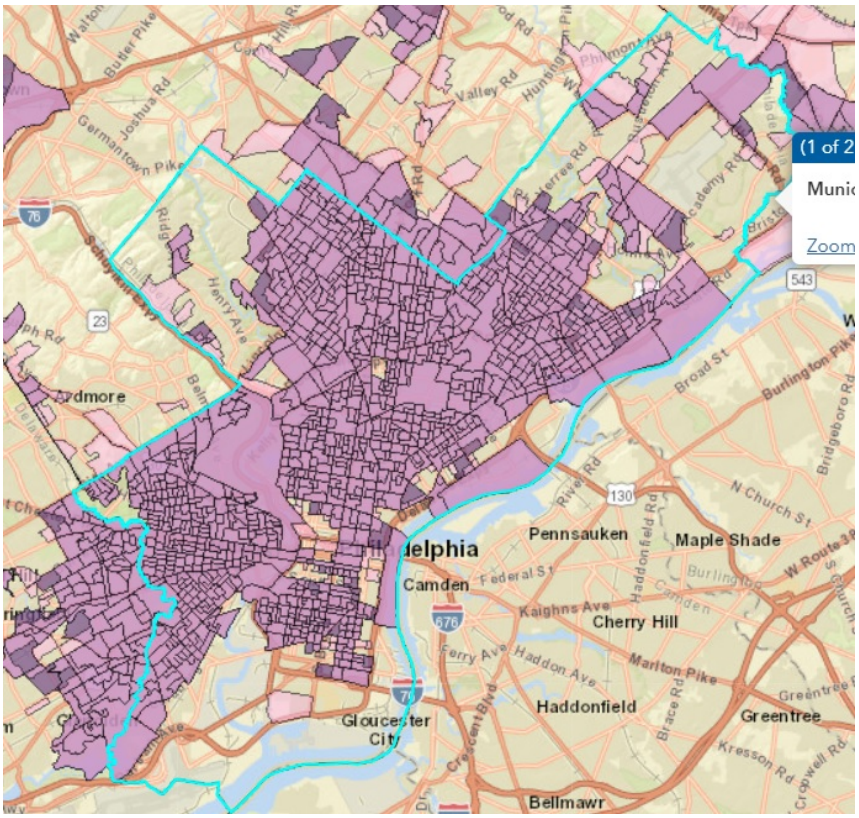
   Response: Thank you.

5. Lynn Robinson commented on the 2020 Community Scale Air Toxics Ambient (CSAT) Monitoring Grant Project, asking why Center City was identified as an Environmental Justice (EJ) area and why North Philadelphia was not included in the CSAT Grant. Lynn Robinson also commented that the 2014 Cancer Mortality rate should be included as justification for monitoring in North Philadelphia using the CSAT Grant. (5)

   Response: AMS appreciates the commenter's concern for EJ in the City, as well as their concern for the health of the City's citizens.

   First, AMS utilized the EPA and Pennsylvania Department of Environmental Protection (PA DEP) screening tools when considering candidates of monitoring sites for the CSAT project.

The proposed monitoring site in Center City is located in an EJ area based on the definition by the PA DEP, as indicated in the map below:



More information about EJ in Pennsylvania can be found on this PA DEP website: https://www.dep.pa.gov/PublicParticipation/OfficeofEnvironmentalJustice/Pages/PA-Environmental-Justice-Areas.aspx. Launch the EJ Viewer in a web browser and zoom in to Philadelphia.

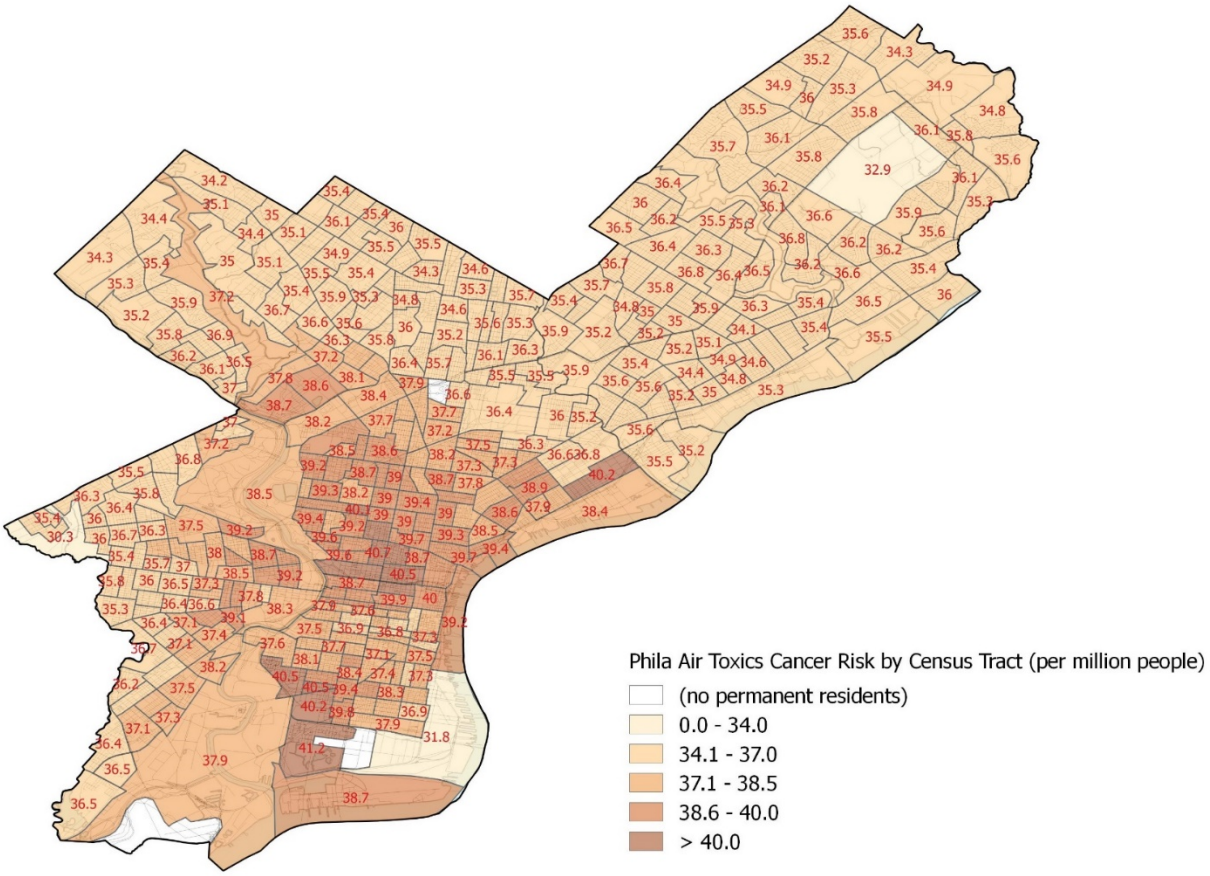
Second, the goal of the 2020 CSAT Grant is to study the impact of the immediate community in South Philadelphia near the oil refinery area. When the sites were initially proposed and analyzed, the siting considerations included:

1. **Proximity and downwind direction to the refinery complex**
2. **South Philly and Southwest Philly (Eastwick) EJ areas**
3. **Highest air toxics cancer risk areas (Center City) according to 2014 NATA**
4. **A reference site in an area with lower air toxics cancer risk**

Therefore, monitoring in North Philadelphia does not align with the goals of the grant.

Third, the 2014 Cancer Mortality data includes cancers of all causes through all exposure pathways (for example: food, water, air, skin exposure, etc.). The use of EPA's National Air Toxics Assessment (NATA) for 2014 (latest version) is more

appropriate for the 2020 CSAT Grant, as it deals with exposure from ambient air. The map below shows cancer risk from the 2014 NATA.



6. Lynn Robinson commented that the Philadelphia Air Quality Survey discriminates against North Philadelphia and that Center City gets most of the monitoring. (5)

Response: EPA and PA DEP screening tools were utilized when considering candidates of monitoring sites for the PAQS project.

When the sites were initially proposed and analyzed, the siting considerations included:

1. **Traffic density and congestion**
2. **Building density (buildings contain boilers and water heaters, which emit air pollution)**
3. **Population density**
4. **Industrial and commercial land use characteristics, stationary sources**
5. **Air pollutant concentrations from previous monitoring data**
6. **Environmental Justice areas**
7. **Other factors such as open spaces, green spaces, etc.**

The Center City area has higher levels of site density (number of sites per square mile) due to these considerations. The monitoring results did show that Center City (near City Hall) had the highest $PM_{2.5}$ (fine particulate matter) pollution.

Adjustments in the monitoring sites were recently made to add a new site in North Philadelphia near 19th Street and W. Susquehanna Ave.

AMS is investing in a mobile air monitoring vehicle. The vehicle will be deployed to various parts of the City, including North Philadelphia and other EJ areas, to measure air pollutants.

7. Lynn Robinson commented on monitoring data from the LAB site, the accuracy of Figure 1 (page 9) of the Plan, and the emphasis of data from the Lewis site in reporting air quality to EPA. (5)

Response: AMS appreciates the commenter's concern regarding monitoring data and the accuracy of Figure 1. CO and NO_x were monitored at the LAB site for many years and discontinued in 2017. As required by EPA, the shutdown of CO and NO_x monitoring at the LAB was documented in the 2017-2018 Plan. For 2021, the LAB site only measures O_3 and $PM_{2.5}$.

The Lewis site (NEW) is an NCORE monitoring site and has additional monitoring requirements beyond other locations (see 40 CFR Part 58.10(a)(3) and 40 CFR Part 58 Appendix D section 3). Monitoring data from all sites are submitted to EPA and used for comparison to the NAAQS. The placement and number of monitors at different sites represents different areas and activities in the City.

8. Lisa Hastings commented on the proposed amendments to Air Management Regulation VI (AMR VI). (6)

Response: AMS appreciates the commenter's concerns regarding AMR VI. The proposed amendment and implementation of AMR VI is beyond the scope of this document.

9. Lisa Hastings commented on the statement on page 12 of the Plan: "… The agency will re-evaluate the number and monitoring locations for toxics due to decreased EPA funding and health risks in key locations." (6)

Response: AMS appreciates the commenter's concerns regarding evaluation of air monitoring locations due to funding. AMS is deleting the comment on page 12 and replacing it with the following for more clarity:

- ~~**The agency will re-evaluate the number and monitoring locations for toxics due to decreased EPA funding and health risks in key locations.**~~
- **The agency will consider monitoring data from the Philadelphia Air Quality Survey (PAQS) project, the Community Scale Air Toxics Ambient Monitoring grant, the mobile monitoring project, and other monitoring projects to evaluate concentrations of air pollutants throughout the city. Based on these results *and funding from EPA*, the agency plans to propose updates to FRM/FEM and air toxics monitoring locations *if needed*.**

10. Lisa Hastings commented on the 2020 CSAT Grant regarding the designation of Center City as an Environmental Justice (EJ) area. (6)

    Response: See response to comment #5.

11. Lisa Hastings commented that additional explanation is needed for the following statement on page 12 of the Plan: "… The agency would like to consider the establishment of an asset management framework for the monitoring system and develop an air quality monitoring modernization plan as opportunities for sustainability." (6)

    Response: The ambient air quality monitoring system is a national asset that provides standardized information for implementing the Clean Air Act and protecting public health. The EPA and state and local agencies cooperatively manage the system, with each playing different roles in design, operation, oversight, and funding. For example, EPA establishes minimum requirements for the system, and state and local agencies operate the monitors and report data to EPA.

    Officials from EPA and selected state and local agencies have identified challenges to be addressed related to sustaining the entire national monitoring system. For example, they said that infrastructure is aging while annual EPA funding for state and local air quality management grants, which cover monitoring, has decreased by about 20 percent since 2004 after adjusting for inflation.

    Publicly released December 7, 2020, the U.S. Government Accountability Office (GAO) published a report that presented the results of a two-and-a-half-year performance audit of the nation's ambient air monitoring system and how it is managed. Titled, "Air Pollution: Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System," the report is available here: https://www.gao.gov/products/GAO-21-38.

    Recommendation number one provides that EPA, in consultation with state and local agencies, establish an asset management framework for the monitoring system that

includes key characteristics and targets resources toward assets that provide the greatest value.

EPA plans to develop a national asset management framework, per the report's recommendation. AMS plans to employ any asset management program developed by EPA to target and prioritize our resources to improve our monitoring network. AMS currently utilizes the Asset Tracking feature in our data acquisition system. Recommendation number two included that EPA, in consultation with state and local agencies, develop an air quality monitoring modernization plan that aligns with leading practices.

EPA also plans to develop an air quality monitoring modernization plan to address air quality concerns that have changed, from a system that consists of fixed locations across the country using specific methods that began in the 1970s. AMS plans to employ any additional strategic approach developed by EPA to modernize the system to better meet additional information needs.

12. Clean Air Council (CAC) commented that AMS should provide more information regarding its re-evaluation of the number and monitoring locations for toxics, including: increased transparency in any budget reductions from EPA for toxics monitoring; why AMS is more defensive than offensive in developing the Plan; and that AMS should expand rather than decrease toxics monitoring, and if AMS cannot expand, explain why. The CAC comments pertain to page 12 of the Plan which states "… The agency will re-evaluate the number and monitoring locations for toxics due to decreased EPA funding and health risks in key locations." (7)

    Response: See response to comment #9.

    Additionally, if AMS reduces or re-locates any required SLAMS (state or local air monitoring station) toxics monitoring, AMS will detail the reduction or relocation in the Plan.

    Funding is a key component to increasing or decreasing toxics monitoring. While funding for SLAMS monitoring has stagnated or decreased on an annual basis, AMS has been aggressive in seeking other sources of grant funding for non-SLAMS monitoring projects, including: Philadelphia Air Quality Survey (PAQS) (see Appendix B of the Plan), 2020 Community Scale Air Toxics (CSAT) Grant (see Appendix C of the Plan), and Mobile monitoring station (see page 13 of the Plan)

13. CAC commented that, based on Figure 1 of the Plan (see page 9), AMS should expand the monitoring network to include monitoring locations in North, Southeast, and Southwest

Philadelphia. CAC also commented that the proposed monitoring locations for the 2020 CSAT Grant should include North and Northeast Philadelphia and that AMS's justifications for siting monitors under the CSAT Grant are insufficient. Finally, CAC commented that AMS's map of proposed toxics monitors does not correspond with EPA's 2017 TRI data. (7)

Response: Page i of the Plan documents the objective for the SLAMS monitoring locations:

> **"… The objective for much of our network is to measure pollutants in areas that represent high levels of contaminants and high population exposure. Some monitoring is also done to determine the difference in pollutant levels in various parts of the City, provide long term trends, help bring facilities into compliance, provide real-time monitoring and provide the public with information on air quality."**

Additional details for each monitor and pollutant are provided starting on page 21 of the Plan.

The comments on the CSAT grant are addressed in the response to comment #5.

The 2017 TRI data provided by CAC to support a toxics monitor for Northeast Philadelphia is misleading. Although half of the 2017 TRI facilities may reside in the Northeast, 80% of the total air emissions (632.9 thousand pounds) are from facilities in South Philadelphia (facilities below the RED line). Therefore the current locations of the air toxics monitors aligns with objectives on Page i of the Plan.

2017 TRI Factsheet: City – Philadelphia, PA

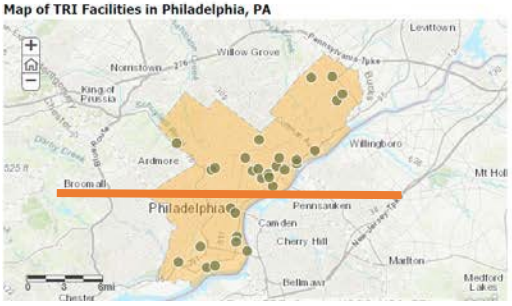
Data Source: 2019 Updated Dataset (released March 2021)

You are here: EPA Home » Toxics Release Inventory (TRI) Program » 2017 TRI National Analysis: Where You Live » 2017 TRI Factsheet: City – Philadelphia, PA

Go To New
Print View
Español

The Toxics Release Inventory (TRI) tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. Certain industrial facilities in the U.S. must report annually how much of each chemical is recycled, combusted for energy recovery, treated for destruction, and disposed of or otherwise released on- and off-site. This information is collectively referred to as production-related waste managed.

Map of TRI Facilities in Philadelphia, PA



Quick Facts for 2017

	Philadelphia, PA	United States
Number of TRI Facilities:	30	21,902
Total Production-Related Waste Managed:	3.7 billion lbs	29.4 billion lbs
Total On-site and Off-site Disposal or Other Releases:	1.1 million lbs	3.9 billion lbs
Total On-site:	917.0 thousand lbs	3.5 billion lbs
• Air:	789.3 thousand lbs	617.9 million lbs
• Water:	127.7 thousand lbs	191.4 million lbs
• Land:	0 lbs	2.7 billion lbs
Total Off-Site:	197.7 thousand lbs	435.4 million lbs

14. CAC commented that it supports the use of low-cost sensors and requests that AMS provide an analysis of how low-cost monitoring could be used in practice to supplement and improve the air monitoring network throughout Philadelphia. (7)

Response: AMS appreciates the commenter's support of low-cost sensors to supplement the City's air monitoring network. The use of low-cost sensors must be careful and targeted. AMS and other agencies have identified a number of low-cost sensors to have data quality that is not comparable to FRM/FEM instruments, because they either over or under estimate pollutant concentrations.

AMS is currently using specially selected low-cost sensors with the PAQS Project (see Appendix B of the Plan). A preliminary report describing the project and the results are posted on the AMS website: https://www.phila.gov/media/20210316150355/PAQS_Report_Sept4-2020_final.pdf.

15. The CAC commented on AMS's justification for the location and placement of the ROX monitor. (7)

Response: The ROX monitor meets the objective stated on Page i of the Plan:

> **"… The objective for much of our network is to measure pollutants in areas that represent high levels of contaminants and high population exposure. Some monitoring is also done to determine the difference in pollutant levels in various parts of the City, provide long term trends, help bring facilities into compliance, provide real-time monitoring and provide the public with information on air quality."**

ROX is unique from other monitoring locations due to the elevation difference from other locations. Since air pollution is affected by changes in altitude, ROX provides an opportunity to compare ambient concentrations from other monitoring locations. ROX is situated at a higher elevation than other monitoring sites.

The placement of the ROX monitor in relation to the forest meets the siting requirements from 40 CFR Part 58 Appendices D and E.

16. The CAC commented that AMS should provide details on how the Proposed Plan is designed to address environmental justice concerns and reiterated concerns from comment #10 requesting that proposed sites from the 2020 CSAT Grant should include sites in North/Northeast Philadelphia. (7)

Response: As stated in the response to comment #12, AMS has been aggressive in seeking other sources of grant funding for non-SLAMS monitoring projects. The focus of these projects is to monitor air quality in overburdened EJ areas and to use

the results to update FRM/FEM and air toxics monitoring locations if needed in future iterations of the Plan.

The CSAT grant is a two-year plan for measuring toxics in the South Philadelphia area which is considered one of the highest overburdened areas. Once completed, AMS plans to apply for additional EPA grants for similar toxics monitoring in other parts of the City, including North and Northeast Philadelphia. The lack of monitoring in North/Northeast Philadelphia under the CSAT grant is addressed in the response to comment # 5.

AMS also purchased a mobile monitor to measure criteria pollutants and VOCs (Benzene, Toluene, Ethylbenzene, m-, o-, and p- Xylene and Total VOCs). When completed, the van will have GPS and plans to start monitoring in the fall of 2021. The mobile monitoring station is a great addition for outreach and to supplement monitoring in EJ communities.

Comments Received – Commentor #1

From: Carl Gershenson
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:53:14 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

In the 1970s the Air Pollution Control Board adopted "Air Management Regulation 10" which was updated in 2013 and addresses pollution emitted from a "complex source within certain sections of the City of Philadelphia." Regulation 10 defines a complex source as a, "facility, building, structure or installation, or combination thereof which emits, or in connection with which secondary or adjunctive activity is conducted which may emit, an air pollutant for which there is a National Ambient Air Quality Standard." Historically, this regulation has been narrowly interpreted to apply to large parking garages at sites like Temple University and Thomas Jefferson University, but in fact this is a regulation which if used to its full potential would substantially reduce traffic related pollution from covered complex sources. The regulation is very broadly written to apply to any "New or modified Complex Sources that are projected by the Department to generate peak rate traffic in excess of 100 motor vehicles per hour; 25 diesel buses per hour; or 12 heavy duty diesel vehicles per hour."

With recent proposals to site several large warehouse and shipping facilities across Philadelphia AMS should begin to apply the Complex Source Permit Review more broadly to all applicable sites in the City--especially since many of the proposed sites are to be sited in environmental justice communities. Mobile sources are the largest source of smog-causing nitrogen oxide (NOx) air pollution in the city, according to the U.S. Environmental Protection Agency's most recent National Emission Inventory. NOx reacts with heat and volatile organic compounds in the atmosphere to form ground-level-ozone, commonly known as smog. Increasing transportation pollution is responsible for negatively impacting public health.

AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Carl Gershenson
2118 Ellsworth St

From: Deborah McIlvaine
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:25:18 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Deborah McIlvaine
3906 VAUX ST

PHILADELPHIA, PA 19129
121-584-8828

From: Erika Morgan
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 11:30:41 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Erika Morgan
165 W Durham St

Philadelphia, PA 19119
610-360-1720

From: Eugene Gualtieri
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:36:44 AM

Dear Jason Li,

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AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Eugene Gualtieri
2425 Lombard Street

Philadelphia, PA 19146
215-735-0687

From: Frank Kohn
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 11:04:23 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Frank Kohn
6655 McCallum St

Philadelphia, PA 19119
215-843-8681

From: Geneva Butz
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:35:11 AM

Dear Jason Li,

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Sincerely,
Geneva Butz
2401 Pennsylvania Ave Apt 12C49

Philadelphia, PA 19130
215-568-7786

From: Hamil Pearsall
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:47:57 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Hamil Pearsall
609 Montrose St

Philadelphia, PA 19147
267-401-3128

From: Jack Byerly
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:39:54 AM

Dear Jason Li,

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Sincerely,
Jack Byerly
1234 S 7th St

Philadelphia, PA 19147
186-090-6682

From: Jennifer Kraft
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:38:21 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Jennifer Kraft
914 South 25th Street

Philadelphia, PA 19146
510-289-8446

From: Jennifer Rovner
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:36:41 AM

Dear Jason Li,

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Sincerely,
Jennifer Rovner
3373 Vaux St

Philadelphia, PA 19129
908-418-1826

From: Jessica Bellwoar
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:20:09 AM

Dear Jason Li,

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Sincerely,
Jessica Bellwoar
617 South St Apt 2

Philadelphia, PA 19147
610-308-0868

From: Jill Turco
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:29:35 AM

Dear Jason Li,

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Sincerely,
Jill Turco
2428 Manton St

Philadelphia, PA 19146
215-872-3289

From: Lori Braunstein
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:48:50 AM

Dear Jason Li,

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Sincerely,
Lori Braunstein
2334 Perot St

Philadelphia, PA 19130
609-238-3449

From: matthew feldman
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:31:39 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
matthew feldman
4837 Pulaski Ave

philadelphia, PA 19144
215-713-4599

From: Michael McQuown
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 11:26:08 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Michael McQuown
5218 Laurens St

Philadelphia, PA 19144
215-240-6204

From: Roberta Camp
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 11:23:39 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Roberta Camp
713 S Warnock St

Philadelphia, PA 19147
215-990-9090

From: Russell Zerbo
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:10:33 AM

Dear Jason Li,

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AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Russell Zerbo
1330 S Melville St

Philadelphia, PA 19143
160-931-4688

From: Sheldon Isaac
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:48:39 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for federal ambient air quality standards for ground-level-ozone (smog) and particulate matter 2.5 (soot) pollution. Attempts to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Sheldon Isaac
658 W Park Ln

Philadelphia, PA 19144
215-842-0863

From: Teora Milson
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:39:13 AM

Dear Jason Li,

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Sincerely,
Teora Milson
266 W Rittenhouse St

Philadelphia, PA 19144
267-444-0660

From: William Edelman
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:32:22 AM

Dear Jason Li,

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Sincerely,
William Edelman
529 Simms St

Philadelphia, PA 19116
215-969-1687

Philadelphia, PA 19146
267-664-3199

Comments Received – Commentor #2

From: Alex Bomstein
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 1:49:14 PM

Dear Jason Li,

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Sincerely,
Alex Bomstein
1438 S 9th St

Philadelphia, PA 19147
215-981-4002

From: Diane Fuchs
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 8:08:50 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Diane Fuchs
1929 Fitzwater St

Philadelphia, PA 19146
202-744-3727

From: donna cosgrove
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 12:23:47 PM

Dear Jason Li,

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Sincerely,
donna cosgrove
2411C Delancey Pl

Philadelphia, PA 19103
215-721-7217

From: Elizabeth Lutes
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 3:52:49 PM

Dear Jason Li,

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Sincerely,
Elizabeth Lutes
1928 S Iseminger St

Philadelphia, PA 19148
215-285-5474

From: Heather Knizhnik
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 3:08:44 PM

Dear Jason Li,

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Sincerely,
Heather Knizhnik
4715 Cedar Ave.

Philadelphia, PA 19143
215-680-4630

From: Jack Braunstein
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 3:01:12 PM

Dear Jason Li,

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Sincerely,
Jack Braunstein
920 s. 50th St., #2

Philadelphia, PA 19143
609-707-2027

From: Jack Schonewolf
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Tuesday, May 25, 2021 12:47:21 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Jack Schonewolf
250 South 13th Street Apt. 9B

Philadelphia, PA 19107
126-747-4400

From: Jason Volpe
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 12:21:36 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Jason Volpe
826 N Capitol St

Philadelphia, PA 19130
814-441-1211

From: Jessica Krow
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 3:33:53 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Jessica Krow
3118 W Penn St

Philadelphia, PA 19129
267-437-2709

From: Justin Hess
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 12:13:40 PM

Dear Jason Li,

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AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Justin Hess
1421 S 4th St

Philadelphia, PA 19147
609-731-1518

From: Karen Guarino Spanton
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 1:51:52 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Karen Guarino Spanton
199 DuPont St

Philadelphia, PA 19127
215-805-3704

From: Lynn Robinson
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 3:52:43 PM

Dear Jason Li,

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Sincerely,
Lynn Robinson
44 Ashmead Place S.

Philadelphia, PA 19144
215-888-1894

From: Marielle Lerner
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Tuesday, May 25, 2021 11:33:38 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Marielle Lerner
328 Dawson St.

Philadelphia, PA 19128
215-917-9535

From: Marisa Wilson
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 7:03:04 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Marisa Wilson
4916 Hazel Ave

Philadelphia, PA 19143
193-163-6302

From: Mary Allen
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 9:32:11 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Mary Allen
6346 Sherwood Rd

Philadelphia, PA 19151
215-473-0665

From: Mary Ann Leitch
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 12:54:20 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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Sincerely,
Mary Ann Leitch
526 Reed St

Phila, PA 19147
215-271-7878

From: Nancy Alderson
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 5:50:39 PM

Dear Jason Li,

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Sincerely,
Nancy Alderson
825 N Bambrey

Philadelphia, PA 19130
215-717-3168

From: Nina Coffin
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 12:50:51 PM

Dear Jason Li,

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Sincerely,
Nina Coffin
3431 Tilden St

Philadelphia, PA 19129
610-506-9351

From: Richard Whiteford
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 2:08:15 PM

Dear Jason Li,

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Sincerely,
Richard Whiteford
1136 Saint Finegan Drive

West Chester, PA 19382
161-024-6797

From: Rosa Zedek
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 12:59:53 PM

Dear Jason Li,

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Sincerely,
Rosa Zedek
5036 CATHARINE ST

PHILADELPHIA, PA 19143
617-820-9535

From: Sandy Brubaker
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 10:10:05 PM

Dear Jason Li,

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Sincerely,
Sandy Brubaker
4076 Manayunk Ave

Philadelphia, PA 19128
123-456-7890

From: Shawn Megill Legendre
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 9:21:18 PM

Dear Jason Li,

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Sincerely,
Shawn Megill Legendre
1 Linden Pl

Philadelphia, PA 19144
202-510-3707

From: Sheila Erlbaum
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 11:51:47 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

In the 1970s the Air Pollution Control Board adopted "Air Management Regulation 10" which was updated in 2013 and addresses pollution emitted from a "complex source within certain sections of the City of Philadelphia." Regulation 10 defines a complex source as a, "facility, building, structure or installation, or combination thereof which emits, or in connection with which secondary or adjunctive activity is conducted which may emit, an air pollutant for which there is a National Ambient Air Quality Standard." Historically, this regulation has been narrowly interpreted to apply to large parking garages at sites like Temple University and Thomas Jefferson University, but in fact this is a regulation which if used to its full potential would substantially reduce traffic related pollution from covered complex sources. The regulation is very broadly written to apply to any "New or modified Complex Sources that are projected by the Department to generate peak rate traffic in excess of 100 motor vehicles per hour; 25 diesel buses per hour; or 12 heavy duty diesel vehicles per hour."

With recent proposals to site several large warehouse and shipping facilities across Philadelphia AMS should begin to apply the Complex Source Permit Review more broadly to all applicable sites in the City--especially since many of the proposed sites are to be sited in environmental justice communities. Mobile sources are the largest source of smog-causing nitrogen oxide (NOx) air pollution in the city, according to the U.S. Environmental Protection Agency's most recent National Emission Inventory. NOx reacts with heat and volatile organic compounds in the atmosphere to form ground-level-ozone, commonly known as smog. Increasing transportation pollution is responsible for negatively impacting public health.

AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Sheila Erlbaum
7150 Bryan St.

Philadelphia, PA 19119
215-242-0000

From: Susan Babbitt
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 7:49:29 PM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Susan Babbitt
319 S 10th St

Philadelphia, PA 19107
126-796-8958

From: wfraser@cleanair.org
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Tuesday, May 25, 2021 9:29:21 AM

Dear Jason Li,

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution. A Boston University study concluded that from 1990 to 2017, greenhouse gas emissions in Philadelphia from cars and trucks increased 22%, far outpacing the city's population growth.

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AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Will Fraser
135 S 19th St

Philadelphia, PA 19103
203-570-7687

Comments Received – Commentor #3

From: Mordecai-Mark Mac Low
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 8:37:50 PM

Dear Jason Li,

I urge the Air Management Services to broaden its monitoring of Complex Sources to include all facilities that meet the peak traffic rate requirements of 100 cars/hour, 25 buses/hour, or 12 trucks/hour.

AMS is tasked with monitoring air pollution in Philadelphia. One of the 3 main objectives of AMS's air monitoring network is to, "Support compliance with ambient air quality standards and emissions strategy development." Philadelphia is currently out of attainment for the federal ambient air quality standard for ground-level-ozone (smog). Any attempt to attain and maintain federal air quality standards in Philadelphia must include a reduction of air pollution from mobile sources, as opposed to focusing almost solely on stationary sources. Motor vehicles produce 60% of Philadelphia's total air pollution.

In the 1970s the Air Pollution Control Board adopted "Air Management Regulation 10" which was updated in 2013 and addresses pollution emitted from a "complex source within certain sections of the City of Philadelphia." Regulation 10 defines a complex source as a, "facility, building, structure or installation, or combination thereof which emits, or in connection with which secondary or adjunctive activity is conducted which may emit, an air pollutant for which there is a National Ambient Air Quality Standard." Historically, this regulation has been narrowly interpreted to apply to large parking garages at sites like Temple University and Thomas Jefferson University, but in fact this is a regulation which if used to its full potential would substantially reduce traffic related pollution from covered complex sources. The regulation is very broadly written to apply to any "New or modified Complex Sources that are projected by the Department to generate peak rate traffic in excess of 100 motor vehicles per hour; 25 diesel buses per hour; or 12 heavy duty diesel vehicles per hour."

With recent proposals to site several large warehouse and shipping facilities across Philadelphia AMS should begin to apply the Complex Source Permit Review more broadly to all applicable sites in the City--especially since many of the proposed sites are to be sited in environmental justice communities. Mobile sources are the largest source of smog-causing nitrogen oxide (NOx) air pollution in the city, according to the U.S. Environmental Protection Agency's most recent National Emission Inventory. Increasing transportation pollution is responsible for negatively impacting public health.

AMS's Air Monitoring Network Plan should include expanded air quality monitoring of new and existing sources of motor vehicle emissions in order to more accurately address Philadelphia's significant mobile source air pollution and current nonattainment of federal ambient air quality standards.

Sincerely,
Mordecai-Mark Mac Low

2527 Naudain St
Philadelphia, PA 19146
215-732-2310

Comments Received – Commentor #4

From: James Mullison
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan
Date: Monday, May 24, 2021 8:30:55 PM

Dear Jason Li,

Philly Thrive members are concerned about air pollution in South/Southwest Philadelphia communities from increased traffic and idling as the former PES refinery site is developed into a logistics center. We are requesting that the city implement “Air Management Regulation 10” to conduct a Traffic Impact Study (TIS) for the site to determine the impact of future traffic generated from the Hilco logistics center development and to identify roadway improvements and or other mitigation measures that may be necessary.

Regulation 10 defines a complex source as a, “facility, building, structure or installation, or combination thereof which emits, or in connection with which secondary or adjunctive activity is conducted which may emit, an air pollutant for which there is a National Ambient Air Quality Standard.” Historically, this regulation has been narrowly interpreted to apply to large parking garages at sites like Temple University and Thomas Jefferson University, but in fact this is a regulation which if used to its full potential would substantially reduce traffic related pollution from covered complex sources. The regulation is very broadly written to apply to any “New or modified Complex Sources that are projected by the Department to generate peak rate traffic in excess of 100 motor vehicles per hour; 25 diesel buses per hour; or 12 heavy duty diesel vehicles per hour.”

With the proposed building of several large warehouse and shipping facilities across Philadelphia amid already increasing transportation pollution, AMS should start applying the Complex Source Permit Review to all applicable sites in the City including the former PES refinery site. Increased use of the Complex Source Permit and Complex Source Review will allow the City to decrease transportation pollution and support future environmental compliance.

We are also pleased that AMS got a grant from EPA for Community-Scale Air Toxics Ambient Monitoring, and also that South Philly near the refinery has been chosen as a monitoring site. Given the importance of air toxics to the health of our community, we hope that this will be the start of more monitoring of air toxics in neighborhoods.

Thank you,

Mrs. Carol Foy,

Debbie Robinson,
Lisa Hastings,
Sheila Tripathy,
James Mullison

On behalf of Philly Thrive

Comments Received – Commentor #5

From: Lynn Robinson
To: JiaZheng Li
Subject: 2021-2022 Air Monitoring Network Plan
Date: Tuesday, May 25, 2021 12:00:44 AM
Attachments: Comment AMS 2021-22 Air Monitoring.pdf

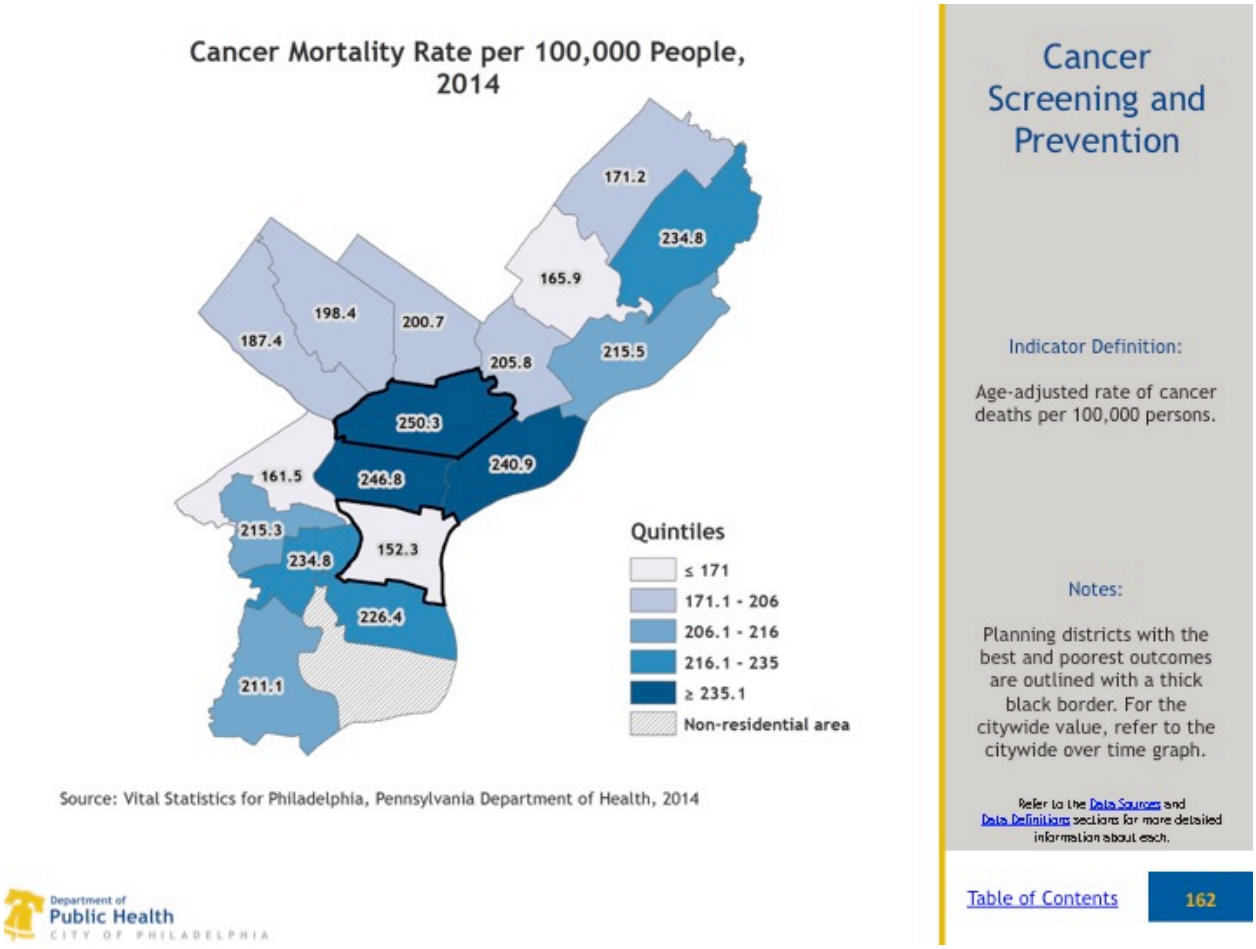
Thank you for taking public comments. They are attached
Lynn

Public Comment on AMS 2021-2022 Air Monitoring Network Plan
Lynn Robinson, director Neighbors Against the Gas Plants
nixthegasplants@gmail.com 215-888-1894

Thank you for taking public comments! Due to a family health emergency these last 2 weeks, these comments are brief. I'm beginning with the end of your plan and moving backwards.

1. On page 64: 2020 Community-Scale Air Toxics Ambient Monitoring Grant Project.

Glad to see this happening near the PES Refinery area but the summary says, "All proposed monitoring areas are Environmental Justice areas." How is Center City an environmental justice area and why is North Philadelphia is left out? Look at the Philadelphia Health Department 2014 statistics for cancer mortality in the North section. It says 250.3 per 100,000 people. This was the highest in the city. North is predominantly African American and low income. It is unquestionably EJ. Please end the dismissal and discrimination against this population. **Please Add North Philadelphia!! Lots of nice people live here!**



2. On page 60, the Philadelphia Air Quality Survey. Center City gets most of the monitoring. It discriminates against a very polluted part of the city, the North section. Please make a correction.

3. Air monitoring stations: Figure 1. Is it incomplete?

- Figure 1 says that Lycoming only monitors ozone and PM 2.5. On page 22, Lycoming detailed LAB information says Parameter: ozone, Monitoring Type: SLAMS. Ozone is not all there is to SLAMS. This is confusing for the public. Can you explain how the background levels were taken from Lycoming station in this AMS approved 2017 AECOM report, which claims that CO and NOx background levels were measured at Lycoming?

NORESCO / SEPTA
Modeling of New GE Engines
Table 3 - Comparison of the Midvale Facility Ambient Air Impacts to NAAQS

Pollutant	Averaging Period	Project Impact Based on Stack Height (Hs) Hs = 50 ft ($\mu g/m^3$)	Background[1] ($\mu g/m^3$)	Total Impacts Hs = 50 ft ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS Hs = 50 ft (%)
NO_2[2]	1-hour (Tier 1)	17.60	109.1	126.7	n/a	n/a
	1-hour (Tier 2)	14.08	109.1	123.1	188	65.5%
	Annual (Tier 1)	0.53	32.6	33.1	n/a	n/a
	Annual (Tier 2)	0.40	32.6	33.0	100	33.0%
CO	1-hour	50.83	2,633	2,684	40,000	6.7%
	8-hour	19.86	1,946	1,966	10,000	19.7%
PM_{10}	24-hour	0.05	64.0	64.0	150	42.7%
	Annual	2.55E-03	n/a	n/a	n/a	n/a
$PM_{2.5}$[2]	24-hour	0.02	29.3	29.4	35	83.9%
	Annual	1.56E-03	9.8	9.8	12	81.4%
SO_2[3]	1-hour	0.17	28.8	29.0	196	14.8%
	3-hour	0.16	28.8	29.0	1,300	2.2%
	24-hour	0.10	14.9	15.0	365	4.1%
	Annual	3.41E-03	n/a	n/a	n/a	n/a

Notes:
(1) Background data for CO, NO_2, and $PM_{2.5}$ came from the E. Lycoming St., Philadelphia, PA monitor located approximately 6 km ESE from the Midvale Bus
Background data for SO_2 and PM_{10} came from the Lewis St., Philadelphia, PA monitor located approximately 8 km SE from the Midvale Bus Facility.
(2) NO_2 impacts presented on this table are based upon the USEPA's Tier 1 procedure (100% conversion of NO_x to NO_2) and Tier 2 procedure (80% convers
1-hour impacts and 75% conversion for annual impacts).
(3) 3-hour SO_2 background concentrations were not available from either the USEPA or AMS and were conservatively estimated as equal to the 1-hour SO_2 b

NAAQS = National Ambient Air Quality Standard
USEPA = U.S. Environmental Protection Agency
CO = carbon monoxide
NO_2 = nitrogen dioxide
SO_2 = sulfur dioxide
n/a = not applicable

$\mu g/m^3$ = micrograms per cubic meter
DEP = Department of Environmental Protection
PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 mi
$PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 m

- Figure 1. It shows that Lewis is monitoring a slew of contaminants. Most stations only monitor just a few things. If this is accurate, then AMS is making a report to the EPA about air quality in a large city, mostly based on one spot at Lewis lab?

Comments Received – Commentor #6

From: LIsa Hastings
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan--AMR10
Date: Monday, May 24, 2021 1:10:02 PM
Importance: High

Please officially correct the narrow application of AMR 10, the Complex Source Regulation which currently leads to unregulated air pollution in the city.

While the Complex Source regulation is broadly written to apply to *any* new or modified Complex Sources which alone, together or in combination thereof emits, or in connection with which "secondary or adjunctive activity" is conducted which may emit an air pollutant for which there is a NAAQS, AMS currently *only applies* it to facilities with large parking lots. In fact, I have been told by AMS personnel that AMR10 ONLY applies if there is a large parking lot, which is inconsistent with the regulatory language and causes AMS to underregulate criteria pollutants. This violates AMS's task of supporting achievement of attainment and compliance with NAAQS. Philadelphia is still out of compliance with the Ozone NAAQS and PM2.5, and unless there is better implementation of air quality regulations, it is likely to remain in nonattainment for these NAAQS. Also, the Philadelphia Area Ozone Non-Attainment Area and the State of Pennsylvania are in the Northeast Ozone Transport Region, and will still be subject to "moderate" ozone regulations for this multi-state region even if the Philadelphia area NAA eventually meets the ozone standard. Philadelphia, both for health and to meet legal obligations, needs to fully enforce AQ regulations, not minimize their application. While AMS only regulates air pollution within the city, the City of Philadelphia is responsible for contributing (and hopefully making all efforts to reducing) ozone pollution in the entire ozone NAA and further northeast through New England.

Motor vehicles produce around 60% of Philadelphia's total pollution, and the *percentage* of pollution caused in Philadelphia by cars and trucks is likely to increase because of lowered stationery source pollution with the closing of the oil refineries. The total pollution caused by mobile sources will continue to increase with increasing in traffic in the city. According to EPA's most recent National Emission Inventory, mobile sources are currently the largest source of ozone-producing nitrogen oxide air pollution in the city. According to a Boston University study, greenhouse gas emissions in Philadelphia from cars and trucks increased 22% between 1990 and 2017---and that was before the boom in online and other shopping deliveries and the recent decline in the popularity of public transportation. Just because we no longer are subjected to pollution from the refinery does not mean that there is not significant remaining air pollution or that redevelopment of the site will be air pollution free.

In addition to those that exist or are planned for the Philadelphia region, the new owner of the refinery property is also planning major warehouse and shipping facilities at that site, probably increasing mobile emissions significantly. With existing and planned increases in mobile sources, AMS should start applying the AMR10 to all applicable sites in the city. This is an excellent tool to help reduce Philadelphia's air pollution. Please use it.

Thank you.

Lisa K. Hastings
2001 Hamilton St. P108

Philadelphia, PA 19130
215-575-0823
610-299-9898 (cell)

From: LIsa Hastings
To: JiaZheng Li
Subject: FW: 2021 Air Monitoring Network Plan---comments; future air monitoring; air toxics
Date: Monday, May 24, 2021 5:57:48 PM
Importance: High

Although you probably figured it out, the ending comment refers to AMR VI, not AMR IV.
Thanks.
LKH

From: LIsa Hastings <lkh1066@earthlink.net>
Sent: Monday, May 24, 2021 5:51 PM
To: 'jiazheng.li@phila.gov' <jiazheng.li@phila.gov>
Subject: 2021 Air Monitoring Network Plan---comments; future air monitoring; air toxics
Importance: High

Air toxics monitoring and regulation need to be strengthened by AMS, not 'reevaluated due to (unknown) EPA funding decreases. Toxics are and will remain a serious part of air pollution and air-pollution related illness and deaths in Philadelphia, and I think that any "re-evaluation" of air toxics monitoring should be done with the goal of increasing toxic monitoring. The 2021 plan is very similar to the 2020 plan and in spite of the air toxics monitoring toxics grant project being added, does not clearly have a goal of improving monitoring and regulation of air toxics.

In the summary of future air monitoring, the statement is made that AMS will "re-evaluate the number and monitoring locations for toxics due to decreased EPA funding and health risks in key locations." This sentence is disturbing and unclear, but is also very similar to one of the statement made in the same section of the 2020 air monitoring plan. Planning documents from 2020 and 2021 both indicated that monitoring of air toxics was dependent on "decreased EPA funding", which implies that there is serious consideration of reducing monitoring of air toxics. It is my memory that the special Philadelphia AQ survey document from 2020 also mentioned potentially using the results (not released yet to my knowledge) to lead to reduced air toxics monitoring. Please, take air toxics monitoring off the cutting board!

If the plan had stated that monitoring levels for noncriteria pollutants was dependent on EPA funds, I would see that as the usual statement that…funds are needed. But to automatically assume In a 2021 document that there will be decreased EPA funding (that in turn will "result" in the need to reduce air toxic monitoring) seems to be a regrettable holdover from the last document and administration, or an admission of what is planned to be used as a justification for decreasing this critical monitoring.

"due to decreased EPA funding and health risks in key locations". The addition of "health risks in key locations" was added this year. Exactly what does this phrase mean? Are there also "decreased health risks"? I think the intent was to say that health risks would be factored in monitoring decisions, but it does not say this. Please clarify in the final.

And, are health risks more important in some areas than others? Don't all Philadelphians have the right to live free from the health risks of air toxics? "Key locations" are also not defined. What "locations" are considered "key" and what sets them apart?

I was pleased that EPA awarded AMS a grant for community-scale air toxics ambient monitoring,

since air toxics are not well-monitored or regulated at this time in Philadelphia. This would seem to be a reason for AMS to worry less about the impact of decreased EPA funding for toxics!
Upon examining the appendix that contains information on this grant program, there are some inconsistencies. While it states that "all proposed monitoring areas are Environmental Justice areas, one of them is in Center City which, while there may be high levels of cancer deaths and high ambient air toxics, it hardly qualifies as being an "environmental justice" area, which includes not only health, but racial and economic demographics. Center City also has a lot of residents who have recently moved into the city, maybe already with cancer and wishing to be close to first class health care, versus people other areas that have intergenerational stability of populations….and intergenerational cancer. (I know a woman in Grays Ferry who has cancer and who has 2 daughters with cancer, at least one who has already died…) Philadelphia as a whole probably qualifies as an EJ city, but to single Center City out as an EJ area within the city may reduce the credibility of the study for many.
While Center City has consistently had high cancer and ambient toxics, and monitoring there is reasonable, it is also extremely reasonable to monitor in few miles north, in the Tioga/Nicetown area of north Philadelphia. This area has similar air toxics death ratings to Center City, had significantly worse cancer death ratings than Center City in the 2011 NATA report (EPA 2015 report of 2011 NATA results had a mapping APP, and showed that the Midvale station area (Roberts and Wissahickon) had a cancer death rate of 50, with areas around it having cancer death rates of 48-49. If it is possible to add a station, add one in the Nicetown/Tioga/East Germantown area.
If there are only 5 possible stations, I suggest that AMS move one of the South Philly locations (perhaps the one at the existing monitoring site) and adjust the other so that the South Philly site "splits the difference" between the two, and then move one of the stations near where the highway portion of I-1 passes over Nicetown, near Roberts. This area has toxics from the highway, from buses, from gas generators, from diesel train yards---lots of toxics are flowing in the air in the area, and it clearly qualifies as an environmental justice neighborhood in all respects.
Making this adjustment will increase the usability and credibility of the study.
There were two points added to future direction section that were not present in the 2020 plan, but they should be clarified. Please better explain what "establishment of an asset management framework" for the monitoring system means. The AQ monitoring modernization is probably much needed.
Study of using low-cost sensors to provide real-time, local-scale AQ information, and hopefully will be adopted. When it is, please also make that additional AQ information easily available to the public in "real time"!

I addressed AMR 10 in an earlier comment about future plans. I would like to add a comment on AMR IV and ask that AMS change how it calculates and analyzes air toxics emissions, in addition to monitoring them more. In brief, AMS is still clinging to the method that looks at every air toxic individually, and determines how dangerous it is *as if it was the only air toxic or pollutant present*. In fact, air toxics often are found together, and EPA recognizes that the dangers they pose increase as the *total amount of all toxic* air pollutants increases. I suggest that AMS adopt the cumulative emissions approach in EPA guidance documents in the future. This is true everywhere, but EPA even has a special guidance document about air toxics in urban, EJ communities that I encourage AMS to study and adopt, esp. since interest in EJ in AMS AQ monitoring plans has been expressed for at least two years!

Thank you.
Lisa K. Hastings
2001 Hamilton St. P108
Philadelphia, PA 19130

Comments Received – Commentor #7

From: Chris Ahlers
To: JiaZheng Li
Subject: 2021 Air Monitoring Network Plan/Written Comments of Clean Air Council
Date: Monday, May 24, 2021 11:51:11 PM
Attachments: 2021-05-24 CAC FINAL Comments on AMS Air Monitoring Network Plan.pdf

Via email: jiazheng.li@phila.gov

Air Management Services,

Attached are the written comments of Clean Air Council on the proposed 2021 Air Monitoring Network Plan of the City of Philadelphia.

Thank you for your consideration of the Council's comments.

Chris

--
Christopher D. Ahlers
Staff Attorney
Clean Air Council
135 S.19th Street, Suite 300
Philadelphia, PA 19103
Telephone: 215-567-4004, ext. 125
*Licensed to Practice Law in Pennsylvania (Limited In-House Corporate Counsel)
*Licensed to Practice Law in New York

CLEAN AIR COUNCIL

Pennsylvania Department of Environmental Protection
City of Philadelphia Air Management Services

City of Philadelphia's 2021 Annual Ambient Air Monitoring Network Plan

Air Management Services
321 University Avenue, 2nd Floor
Philadelphia, PA 19104

2021 Air Monitoring Network Plan

Written Comments of Clean Air Council

May 24, 2021

Via email: jiazheng.li@phila.gov

Clean Air Council appreciates the opportunity to provide these written comments on the proposed Air Monitoring Network Plan prepared by Air Management Services for the City of Philadelphia ("Proposed Plan").

In April, a notice of the Proposed Plan was published in the Pennsylvania Bulletin. *See* 51 Pa.B. 2355 (Saturday, April 24, 2021). The 30-day public comment ends on Monday, May 24, 2021. The Proposed Plan was made available on the City's web site: https://www.phila.gov/media/20210413094130/2021-2022_AMNP_draft20210407a.pdf.

1. **AMS Should Provide More Information Regarding Its Re-Evaluation of the Number and Monitoring Locations for Toxics.**

AMS implies that it may be paring down the air monitoring network because of budget cutbacks. *See* page 12 ("[t]he agency will re-evaluate the number and monitoring locations for toxics due to decreased EPA funding and health risks in key locations."). But it does not provide any information regarding the extent of budget cutbacks, either in an absolute sense or in a relative sense. Nor does it indicate what this could mean for the air monitoring network in monetary terms. It does not discuss what it means by "health risks" and "key locations," which would presumably inform its judgment on determining monitoring locations. AMS should provide more detail regarding this statement.

Moreover, the statement by AMS only speaks to funding by the Environmental Protection Agency, rather than to funding by sources at the state and local levels. Given the social justice concerns expressed in the past year and the longstanding environmental justice

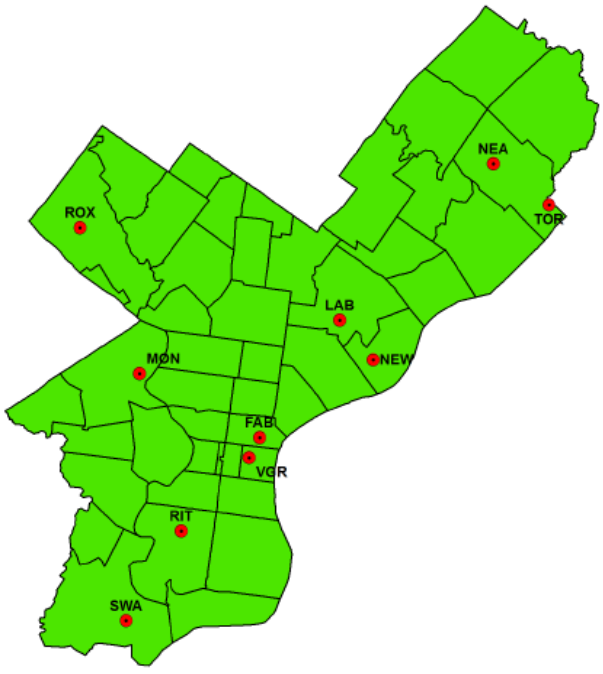
problems in Philadelphia, AMS should explain why it should be on the defensive rather than on the offensive, in developing the air monitoring network.

AMS should not resign itself to making decisions about locating a monitor in one location as opposed to another. Rather, it should be able to expand the air monitoring network for a community without taking something away from another community. If it feels that it cannot do this, then it owes an explanation to the public. It has not done that in the Proposed Plan.

2. AMS Should Expand the Monitoring Network to Include Monitoring Locations in North Philadelphia and Northeast Philadelphia.

For the densely populated area of Philadelphia, there are large gaps in the basic air monitoring network for criteria pollutants. Most if not all of North Philadelphia avoids the air monitoring network:

Figure 1 - 2021 Philadelphia Air Monitoring Network as of July 1, 2021



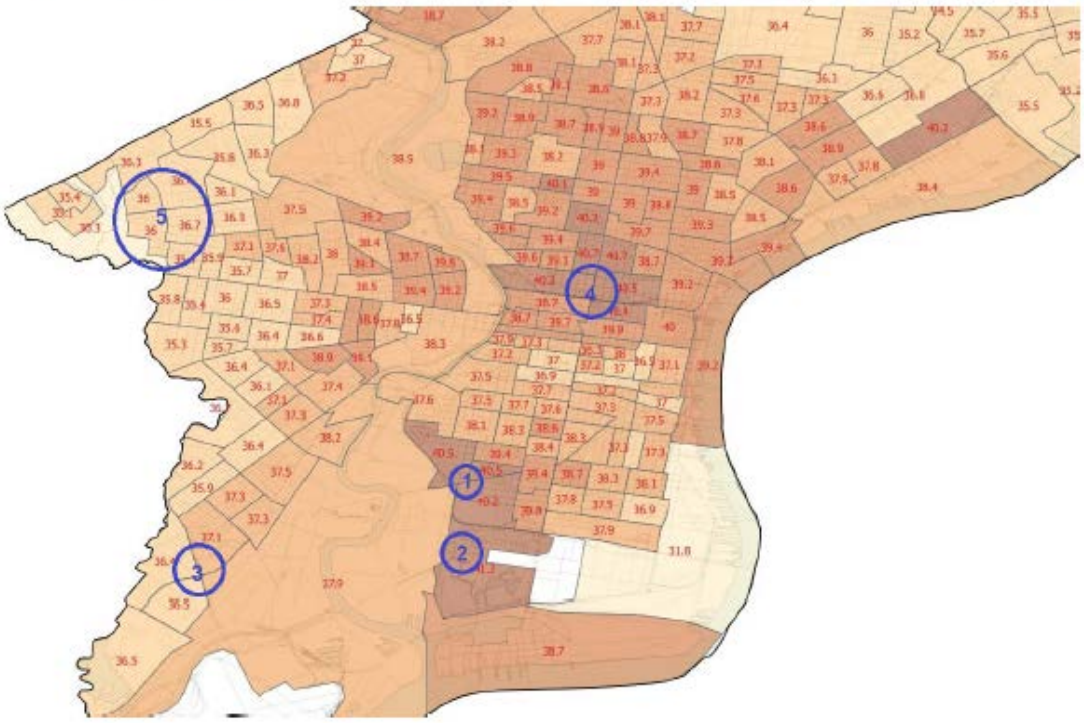
			Parameter																			
AQS Site Code	AMS Site	Address	CO	SO_2	Ozone	NO_y	NOy/NO	PM_{10}	$PM_{2.5}$	Speciated $PM_{2.5}$	PM Coarse	Black Carbon / Ultrafine PM	Carbonyls	PAMS VOC	BaP	TSP Metals (Be, Cr, Mn, Ni, As, Cd, Pb)	Toxics TO15	MET	AMS Site
421010004	LAB	1501 E. Lycoming St			X				X													LAB
421010014	ROX	Eva & Dearnley Sts											X					X				ROX
421010024	NEA	Grant Ave & Ashton Rd			X																	NEA
421010048	NEW	2861 Lewis St	X	X	X	X	X	X	X	X	X		X	X				X	X			NEW
421010055	RIT	24th & Ritner Sts		X					X	X			X			X		X				RIT
421010057	FAB	3rd & Spring Garden Sts							X													FAB
421010063	SWA	8200 Enterprise Ave											X					X				SWA
421010075	TOR	4901 Grant Ave & James St	X			X			X											X		TOR
421010076	MON	I-76 & Montgomery Drive	X			X			X			X			X	X				X		MON
	VGR	6th & Arch Sts			X				X											X		VGR

See Proposed Plan, page 9. North Philadelphia is located between the Montgomery monitor (MON), the AMS Laboratory monitor (LAB), and the Fire Administration Building monitor (FAB), plus other areas to the north. AMS should explain and substantiate its continuing failure to expand the air monitoring network in North Philadelphia.

AMS should do the same for Southeast Philadelphia and Southwest Philadelphia, where there are no monitoring locations, either.

Although AMS proposes to expand the network for air toxics under a grant from EPA in 2020, it repeats this problem even more glaringly. It ignores not only North Philadelphia but also Northeast Philadelphia, even though there is a monitor for criteria pollutants there. In fact, much of North Philadelphia and Northeast Philadelphia are simply cut off the AMS map identifying proposed monitoring locations for air toxics:

Proposed Monitoring Locations:



(Numbers in red indicate estimated air toxics cancer risk (per million population) by census tract according to EPA 2014 NATA study)

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See Proposed Plan, page 65.

AMS does not provide a sufficient analysis for why certain locations were chosen for toxics monitoring and others were not. There does not appear to be any meaningful justification based on relative cancer risk. The cancer risk in North Philadelphia is equal to or greater than the risk in other areas chosen for the study. AMS should explain why it cannot propose

additional monitors in North Philadelphia and Northeast Philadelphia, without relocating other proposed monitors.

The failure to propose toxics monitors in Northeast Philadelphia is surprising because EPA maintains a map of Toxic Release Inventory (TRI) facilities (certain facilities that report releases of toxic chemicals), and about half of them are concentrated in Northeast Philadelphia:

2017 TRI Factsheet: City – Philadelphia, PA

Data Source: 2019 Updated Dataset (released March 2021)

You are here: EPA Home » Toxics Release Inventory (TRI) Program » 2017 TRI National Analysis: Where You Live » 2017 TRI Factsheet: City – Philadelphia, PA

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The Toxics Release Inventory (TRI) tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. Certain industrial facilities in the U.S. must report annually how much of each chemical is recycled, combusted for energy recovery, treated for destruction, and disposed of or otherwise released on- and off-site. This information is collectively referred to as production-related waste managed.

Map of TRI Facilities in Philadelphia, PA

Quick Facts for 2017

	Philadelphia, PA	United States
Number of TRI Facilities:	30	21,902
Total Production-Related Waste Managed:	3.7 billion lbs	29.4 billion lbs
Total On-site and Off-site Disposal or Other Releases:	1.1 million lbs	3.9 billion lbs
Total On-site:	917.0 thousand lbs	3.5 billion lbs
• Air:	789.3 thousand lbs	617.9 million lbs
• Water:	127.7 thousand lbs	191.4 million lbs
• Land:	0 lbs	2.7 billion lbs
Total Off-Site:	197.7 thousand lbs	435.4 million lbs

See U.S. Environmental Protection Agency, 2017 TRI Factsheet: City – Philadelphia, PA, https://enviro.epa.gov/triexplorer/tri_factsheet.factsheet?pYear=2017&pstate=PA&pcity=philadelphia&pParent=NAT (Data Source: 2019 Updated Dataset (released March 2021)) (visited May 24, 2021). Simply put, AMS's map of proposed toxics monitors does not correspond with EPA's map of TRI facilities. AMS would not extend air toxics monitoring further northeast of the two dots after the word "Philadelphia" in EPA's map above.

AMS should explain why North Philadelphia and Northeast Philadelphia are being overlooked. They have areas of high cancer risk, environmental justice concerns, and polluting facilities.

3. **AMS Should Consider Low-Cost Monitors to Supplement and Expand the Official Network, Keeping in Mind Limitations of Technology.**

AMS implies that it may consider the use of low-cost sensors in connection with the air monitoring network. *See* page 12 ("[t]he agency would like to understand the performance and remedy the challenges on the use of low-cost sensors to provide real-time, local-scale air quality information"). But it does not provide any details or analysis following this statement. It should elaborate on this statement.

The Council largely supports the development of a low-cost air monitoring network or a distributed air monitoring network that can be used to fill in the gaps of the official network. This could help to expand data on air quality that could be used to improve the positioning of

official monitors and the expansion of the existing network. The Council acknowledges the limitations of these monitors in comparison with the official monitoring stations.

As an example of their productive use, low-cost monitoring could be used as a tool for expanding knowledge of air quality in North Philadelphia, Northeast Philadelphia, and in other gaps in the network. *See* Comment #2 above.

AMS should provide an analysis of how low-cost monitoring could be used in practice to supplement and improve the air monitoring network throughout Philadelphia.

4. <u>AMS Should Clarify the Justification for the Location of the Roxborough Monitor</u>.

AMS uses the Roxborough monitor (ROX) as a neighborhood level monitor for community exposure to air toxics. *See* Proposed Plan, page 25. It has monitored carbonyls since 2003 and toxics since 2004. *See id.* Presumably, the largest source of air toxics in the area is Interstate 76, which lies near the monitoring station to the west and south. But there is a small forest between I-76 and the monitoring station, and it appears to come very close to the location of the monitor, potentially shielding it from highway impacts and impacts from other sources:

Figure 5 – ROX North Aerial View

See Proposed Plan, page 27.

The yellow thumbtack in the lower right-hand corner of this Google Earth map demonstrates this more vividly:

See also Google Map, https://www.google.com/maps/place/Lower+Roxborough+Filter+Station/@40.0504289,-75.2442103,389m/data=!3m1!1e3!4m5!3m4!1s0x89c6b8d61e0a8b0d:0xcc1afda73d2e5d83!8m2!3d40.0499037!4d-75.241124. The trees appear to have overgrown the monitoring station's height significantly. While the altitude of the monitor (the yellow thumbtack) is 333 feet, the altitude of many of the neighboring trees is over 400 feet, according to Google Earth.

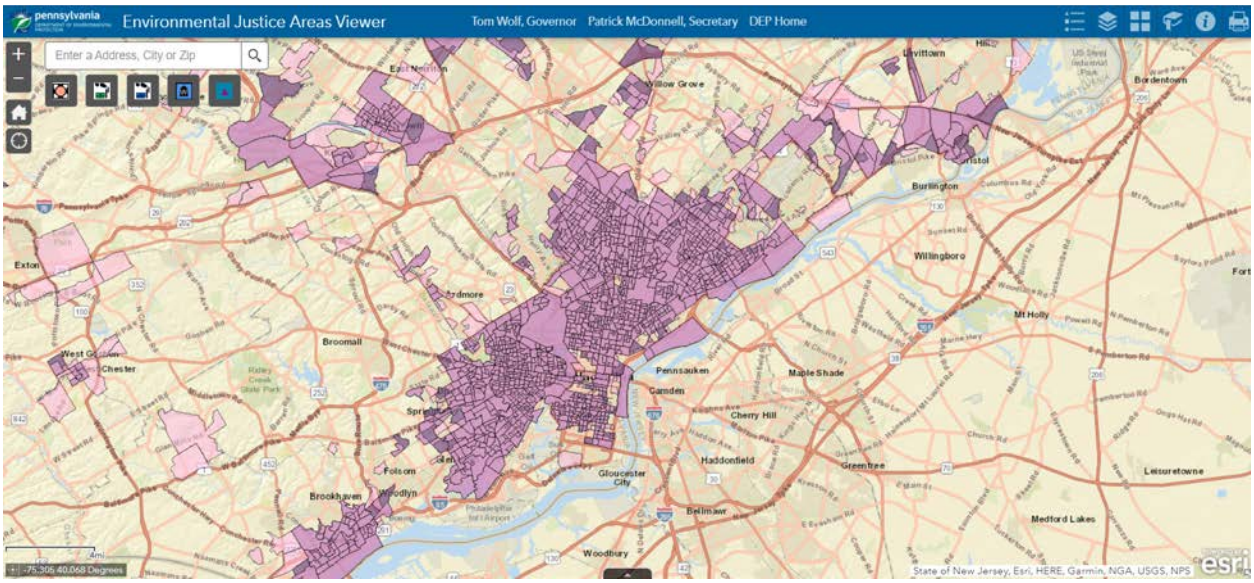
It does not appear that this monitoring station is located here to pick up the water filter plant.

AMS should provide more information about the positioning of this monitor, including data on any modeling that may have been done to determine the placement of the monitor. It should also consider moving the monitor back further from the forest and closer to the surrounding neighborhood, in order to better capture neighborhood impacts and avoid shielding from the trees.

5. **<u>AMS Should Clarify Its Criteria For Determining the Location of Monitors in an Environmental Justice Area, Where Virtually All of Philadelphia is an Environmental Justice Area</u>.**

AMS states that it will consider environmental justice concerns in the development of the Proposed Plan. *See* Proposed Plan, page 12 ("[t]he agency would like to consider Environmental Justice during the development of the Air Monitoring Network Plan and look to investigate concentrations in these communities"). But it does not explain how environmental justice concerns are considered in the development of this plan, other than to propose five toxics monitors in well-known areas of cancer risk. AMS should provide details on how the Proposed Plan is designed to address environmental justice concerns.

In addition, AMS should clarify how environmental justice is practically addressed in the Proposed Plan, where virtually all of Philadelphia is an environmental justice area:



See PA Department of Environmental Protection, Environmental Justice Areas Viewer, https://www.arcgis.com/apps/webappviewer/index.html?id=f31a188de122467691cae93c3339469c (visited on May 24, 2021). Merely invoking the phrase "environmental justice" does not provide a meaningful basis to differentiate between different areas within an environmental justice area, for determining the location for an air monitor.

On its face, an environmental justice area is determined by two statistical factors -- the concentration of poverty and the demographic concentration of minority populations. But it is more than these two statistical terms.

It also contemplates the disproportionate burden of pollution that is borne by these communities. That pollution can include air emissions from industrial facilities, cars and trucks, marine vessels, and other sources. This means that AMS should consider the locations of polluting activities to which people are exposed. This includes a number of activities in North and Northeast Philadelphia. *See* Comment #2 above.

AMS should also consider the differential health impacts on the communities suffering from air pollution. A report prepared last year provides some information on differential health impacts. *See* Philadelphia's Community Health Assessment (2020), https://www.phila.gov/media/20201230141933/HealthOfTheCity-2020.pdf. There may be other reports and documentation. But AMS does not discuss this in the Proposed Plan, other than to note health impacts around the five proposed toxics monitoring locations in well-known areas of cancer risk. *See* Proposed Plan, page 64.

Presumably, AMS gathered evidence to support the location of the five proposed air monitors for toxics (as opposed to others) under the grant from the Environmental Protection Agency. *See* Proposed Plan, page 64. But AMS does not discuss this in the Proposed Plan, other than to note the five proposed toxics monitoring locations. This does not mean there are not others. *See* Comment #2 above.

In conclusion, AMS should not simply state that it would like to consider environmental justice, since this is now simply a fashionable thing to say. If AMS would really like to consider environmental justice "during the development of the Air Monitoring Network Plan," now is the time to do so. AMS should provide details regarding how it will do this, and not just for the five proposed toxics monitoring locations.

AMS should revise the Proposed Plan to include the information and analysis that is missing.

Thank you for your consideration of the Council's written comments.

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