48217 COMMUNITY AIR MONITORING PROJECT

Results Update:
New Mt. Hermon Baptist Church Community Air Monitoring Site
Sept 2017 – Sept 2018

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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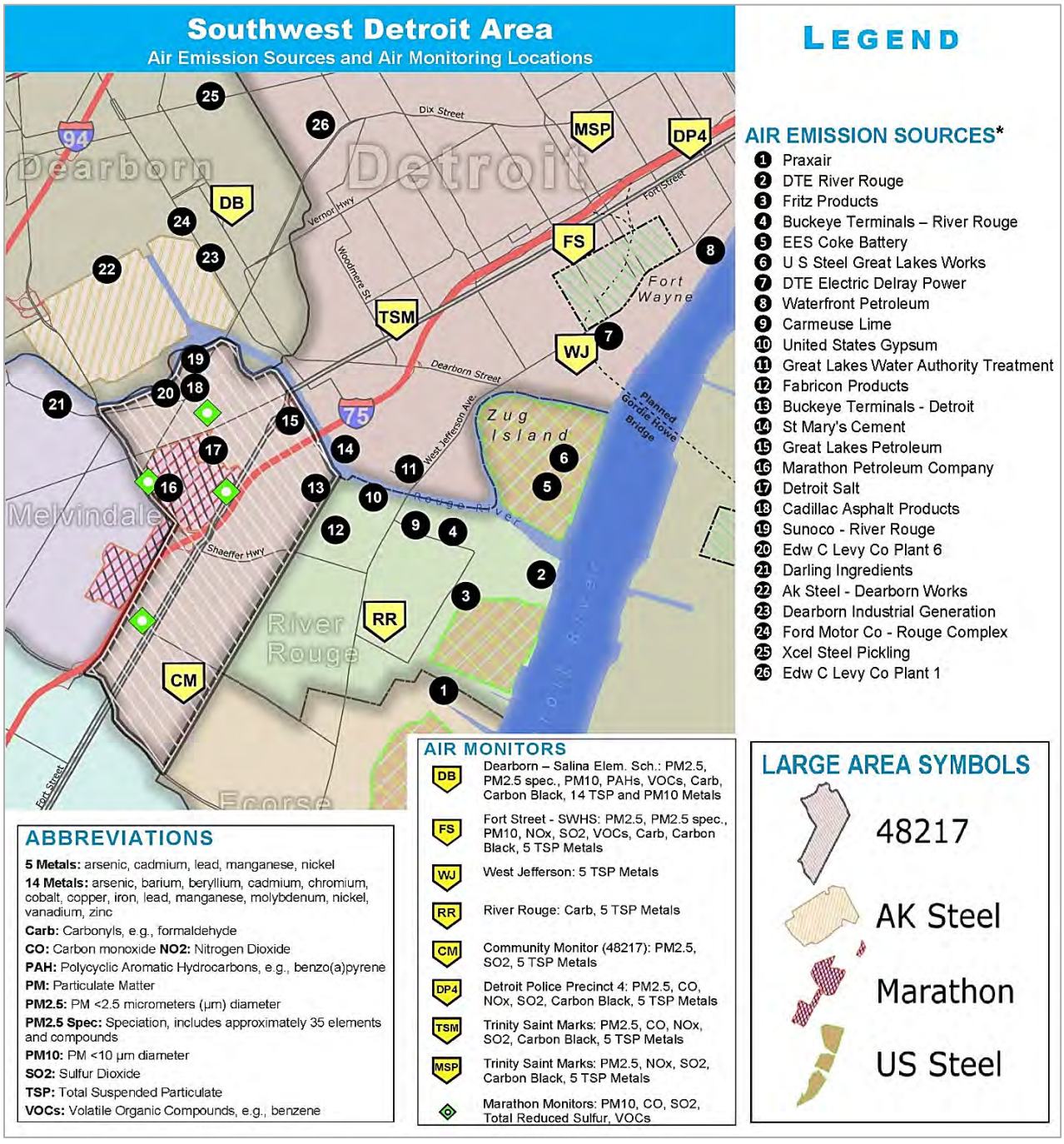
Michigan's Environmental Justice Policy promotes the fair, non-discriminatory treatment and meaningful involvement of Michigan's residents regarding the development, implementation, and enforcement of environmental laws, regulations, and policies by this state. Fair, non-discriminatory treatment intends that no group of people, including racial, ethnic, or low-income populations, will bear a disproportionately greater burden resulting from environmental laws, regulations, policies, and decision-making. Meaningful involvement of residents ensures an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health.

PURPOSE OF REPORT

This report is an update for the public on air monitoring results collected from September 2017 to September 2018 at the 48217 ZIP code community air monitoring site. The report includes:

- Background on community concerns and how the project began
- Review of the air monitoring results
    - Health risk review, comparisons to results from the previous year's review, and comparisons to results from other Michigan sites
- A resource table to get more information about local environmental issues

Figure 1. Map of Southwest Detroit



*Indicates facilities required to report annual emissions

BACKGROUND

For many years, residents of the 48217 ZIP code in Southwest Detroit voiced concerns about impacts from industry and traffic on their air quality and health. Some concerns include environmental injustice, health disparities, odors, lack of notification during environmental emergencies, noise, cumulative impacts, and laws which allow pollutant sources to be regulated individually. Figure 1 shows the larger outdoor air emission sources, major roadways, and details about current air monitoring sites in the area.

A one-year air monitoring study was conducted at New Mount Hermon Missionary Baptist Church in the 48217 ZIP code from September 2016 through September 2017. This was a community led effort in collaboration with state, federal, nonprofit and academic partners. Community meetings were hosted at the church to share the study findings. A final report was issued in May 2018. The report and other information can be found at: www.michigan.gov/48217monitoring.

CURRENT AIR MONITORING AT THE SITE

The Michigan Department of Environment, Great Lakes, and Energy (formerly the Michigan Department of Environmental Quality) is continuing air monitoring for several pollutants at the New Mount Hermon Missionary Baptist Church. The list of compounds being measured include:

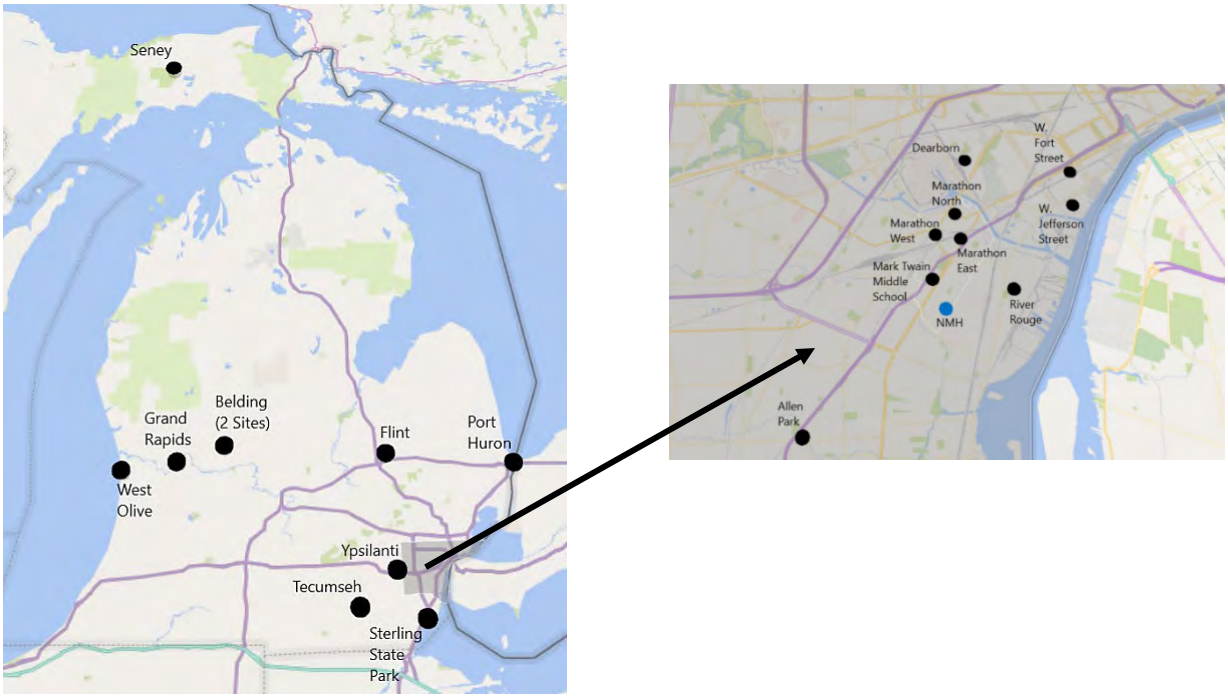
Collected continuously and posting in real-time to the DEQMIAIR.ORG website:

- Fine particulate matter, less than 2.5 microns in diameter ($PM_{2.5}$)
- Sulfur dioxide (SO_2)

Collected on an every 6-day schedule and sent to a laboratory for analysis:

- Metals: arsenic, cadmium, lead, manganese, and nickel

Figure 2. Air monitoring sites discussed in this report



METHODS FOR REVIEWING RESULTS

Air monitoring results were compared to health-based pollutant levels. Government agencies use these levels to protect the public, including sensitive groups like asthmatics and children.

The United States Environmental Protection Agency (U.S. EPA) has established health-based standards called the National Ambient Air Quality Standards (NAAQS) for some pollutants including SO_2, lead, and $PM_{2.5}$. The NAAQS for SO_2 and $PM_{2.5}$ are based on 3 years of results. The lead NAAQS is calculated as a 3-month rolling average. The results from the New Mount Hermon (NMH) site are being compared to the levels of the standards but there is not enough data yet for the 3-year calculation. The State of Michigan has established health-based levels for arsenic, cadmium, manganese and nickel.

Results collected from 2017 to 2018 at the NMH site were also compared to the results collected from 2016 to 2017 at this same site. Since a larger list of pollutants were measured in the original study, the comparison is limited to the smaller list of pollutants that were measured from 2017 to 2018. Results collected from 2017 to 2018 at the NMH site were also compared to results collected at the same time from other Michigan sites. Figure 2 shows the locations of all the air monitoring sites discussed in this report.

AIR MONITORING RESULTS

Results for PM2.5

Figure 3 shows the comparison of the daily averages between September 2016-2017 and September 2017-2018 at the NMH site. Instrument malfunctions in the summer of 2018 caused a loss of data. Overall, the results for both years were similar.

For the more recent year of results, figures 4 and 5 compare the $PM_{2.5}$ level from the NMH site to levels at other sites in Michigan. As shown in figure 5, the level at the Dearborn site was the highest in the state, but levels at Ypsilanti and Allen Park were similar to levels at the NMH site. Levels outside of metro Detroit and Ypsilanti were lower than the NMH site, and levels at the Seney site were the lowest in the state. All sites have levels below the level of the NAAQS.

$PM_{2.5}$

$PM_{2.5}$ describes the small particles in the air. It is a mixture of pollutants, and it is one of the main health risk concerns with air pollution. Breathing a high enough level of $PM_{2.5}$ can cause health issues like heart and lung problems.

Figure 3. Daily $PM_{2.5}$ Levels

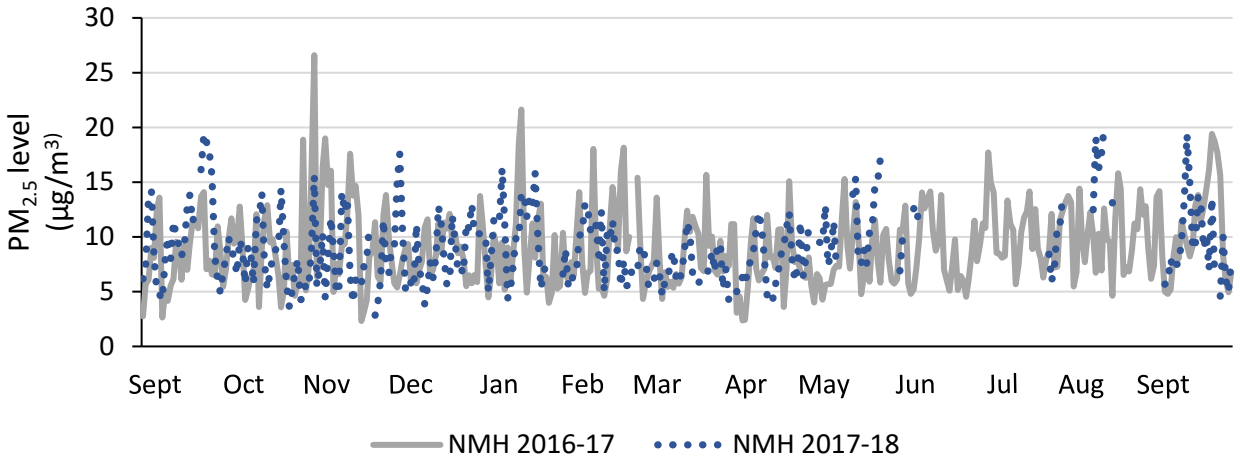


Figure 4. Daily $PM_{2.5}$ Levels Compared to the NAAQS
September 2017-September 2018

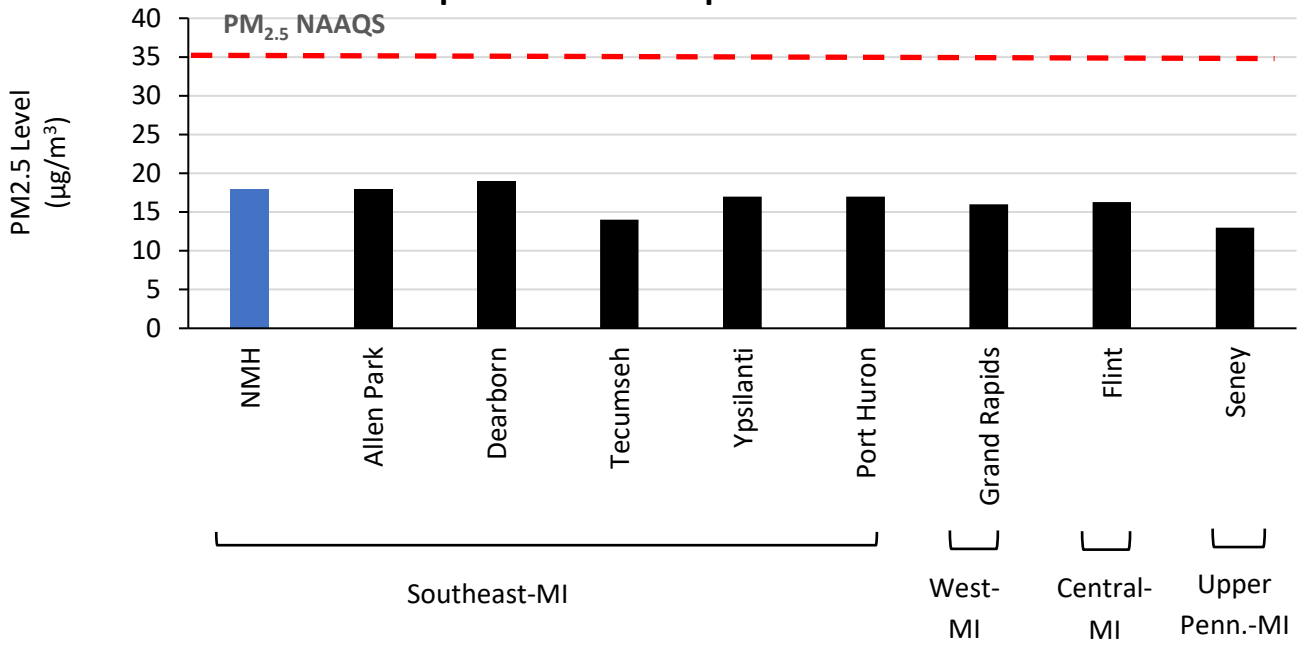
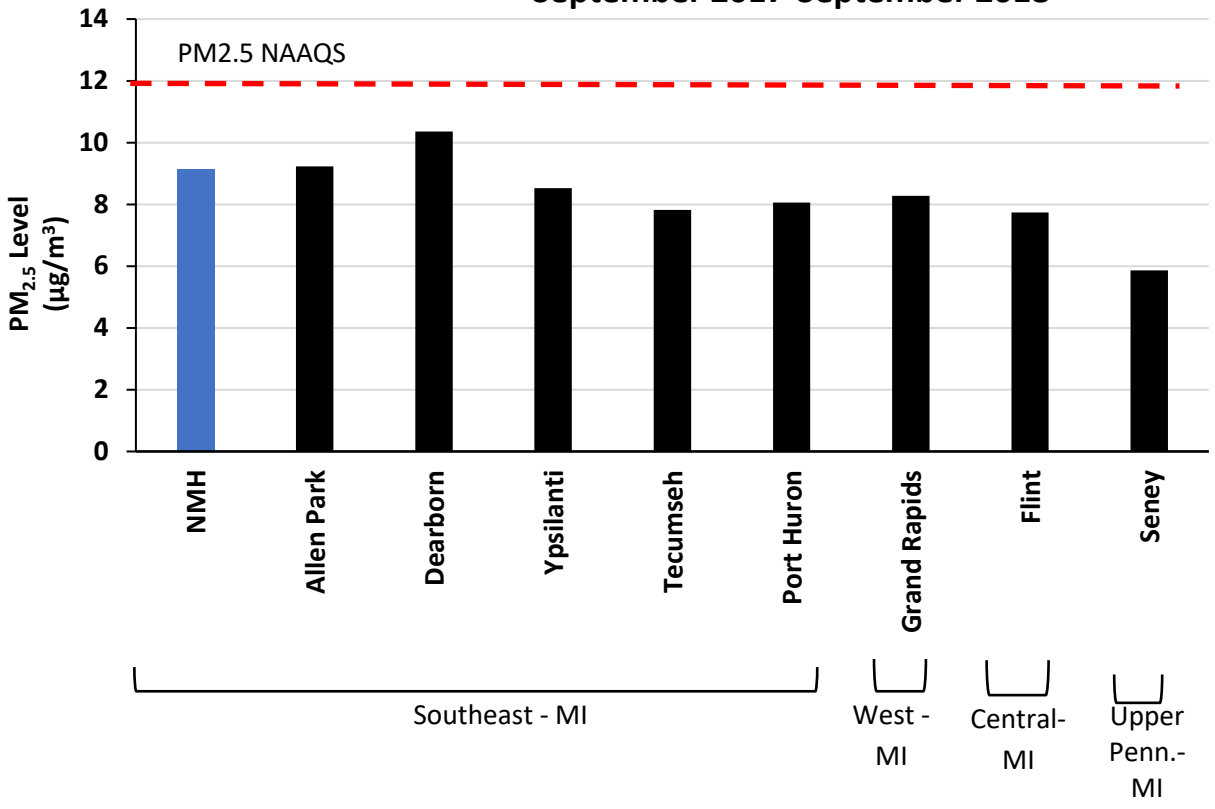


Figure 5. Annual Average $PM_{2.5}$ Levels
September 2017-September 2018



The U.S. EPA's Air Quality Index (AQI) allows for a real-time look at the air quality for a given day and even gives air quality forecasts for the following day or several days. EPA also has "NowCast" which relates hourly data to the AQI. This can allow people to better respond to rapidly changing air quality conditions, such as during a wildfire.

The $PM_{2.5}$ standard is designed to protect sensitive groups, like people with lung disease. Some research studies show health problems occurring at levels below the $PM_{2.5}$ standard for some individuals. These individuals are more sensitive than the groups which the $PM_{2.5}$ standard is designed to protect. The "moderate" category from the AQI is for the $PM_{2.5}$ levels that may still be a health concern for unusually sensitive individuals (Table 1). At these $PM_{2.5}$ levels, some individuals may experience health problems, like shortness of breath.

As shown in Table 1, for the daily $PM_{2.5}$ levels from September 1, 2017- September 30, 2018, 241 days were in the good air quality category, where health problems based on $PM_{2.5}$ pollution would not be expected. 58 days were in the moderate air quality category, where the $PM_{2.5}$ level may have been high enough to be a health concern for extremely sensitive individuals. There were no days measured at levels above the moderate level. The number of days is less than 365 due to instrument malfunctions.

Table 1. Daily AQI Results for PM2.5 at the NMH site

AQI Category	Number of Days $PM_{2.5}$ Level was in Each Category
Good (Green): Not expected to be a health risk	241
Moderate (Yellow): May be a health concern for unusually sensitive individuals	58
Unhealthy for Sensitive Groups (Orange): May be a health concern for sensitive groups	0
Unhealthy (Red): May be a health concern for everyone	0
Very Unhealthy (Purple): Everyone may have more serious health effects	0
Hazardous (Maroon): The entire population is likely to be affected	0

Results for SO_2

Figure 6 shows the comparison of the maximum 1-hour level from each day from September 2016-2017 and September 2017-2018. These levels were both below the NAAQS for SO_2 and in the good AQI category.

As shown in figure 7, these levels are similar to some other areas, but higher than background levels like those seen at Sterling State Park. The 48217 ZIP Code is currently in an SO_2 and ozone non-attainment area, which means that the area is not meeting the NAAQS. The SO_2 non-attainment status was largely determined based on the SO_2 levels at the W. Fort Street site.

SO_2

If SO_2 levels are high enough for even a few minutes, it can be a health concern. This gas can cause breathing problems, especially in sensitive groups like asthmatics.

Figure 6. 1-Hour Daily Maximum SO_2 Levels

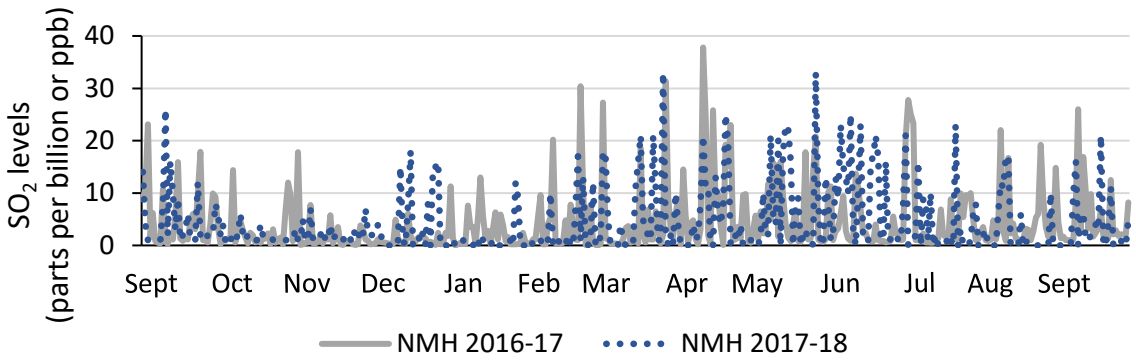
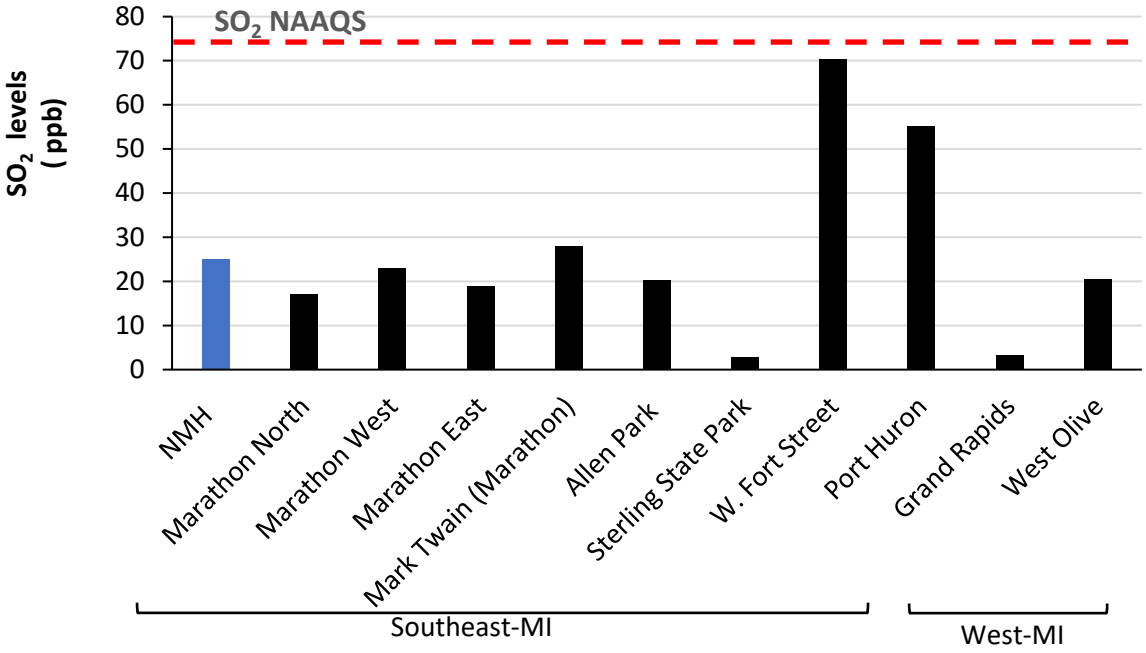


Figure 7. 1-hour SO_2 Levels Compared to the NAAQS September 2017-September 2018



Results for Metals - Lead

As shown in figure 8, lead levels at the NMH site were similar to the previous year's results. All of these levels were below the level of the lead NAAQS.

Levels at the NMH site were similar to some sites, but lower than others (figure 9). This may reflect the different purposes for each site. The NMH site is based on community interests. The Allen Park, Grand Rapids, and Dearborn sites are part of national programs to monitor long-term trends. The Belding and Port Huron sites are near sources that may have high lead emissions.

Lead

Lead causes learning and behavioral problems in infants and children. As compared to breathing it, these sensitive groups are more likely to be exposed to lead through swallowing soil/dust, water, and food.

While breathing lead is not usually the main way that people are exposed, there is also no safe exposure level to lead. The lead NAAQS provides a level of health protection for at-risk groups.

Figure 8. Daily Lead Levels

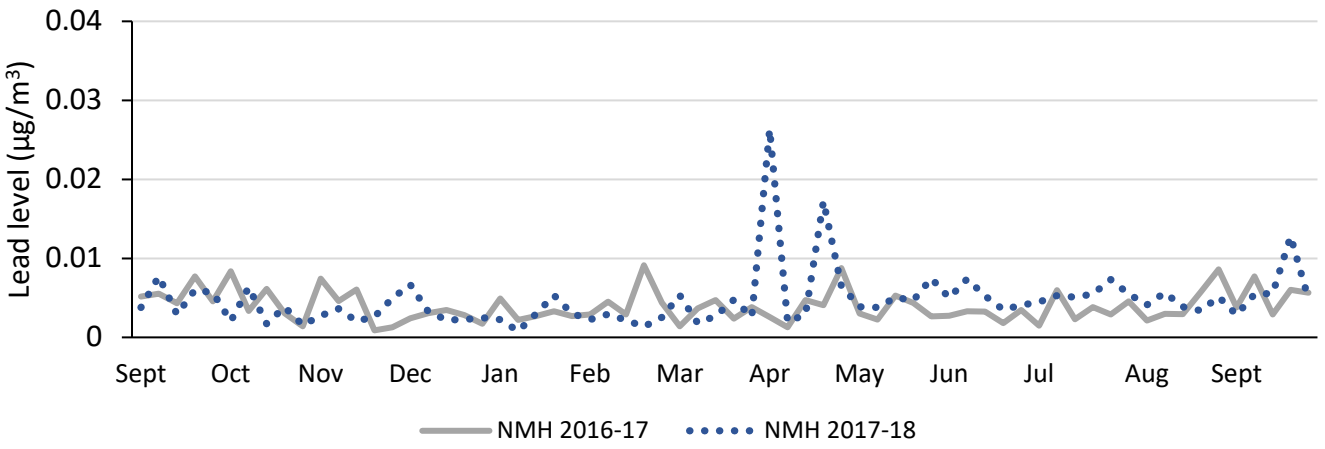
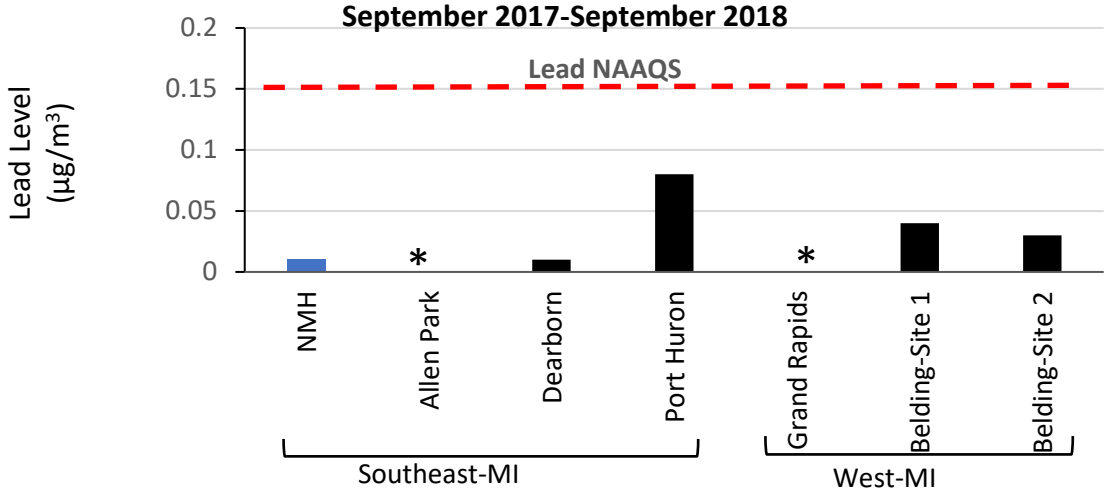


Figure 9. Highest 3-month Average Lead Levels
September 2017-September 2018



* Level detected below 0.01 µg/m^3

Results for Metals - Arsenic

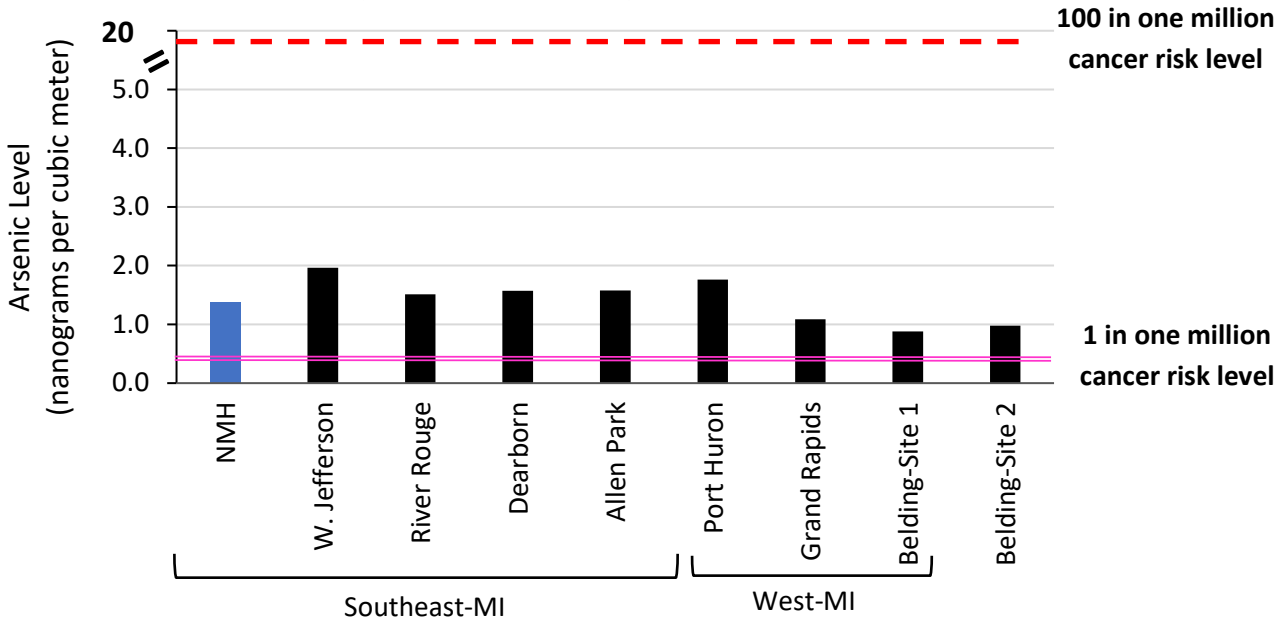
Arsenic levels were similar to arsenic results seen in 2016/2017, and these levels were above the one in one million cancer risk level (Figure 10). Being above the cancer risk level means that there is an increased chance of developing cancer from these arsenic levels, but it does not mean that someone will definitely develop cancer from these levels. The one in one million cancer risk level provides an initial finding for pollutants of concern.

A next step in the review is to look at the 100 in one million risk level, since it is used as an upper limit of acceptable risk when the U.S. EPA evaluates air quality. The arsenic levels at the NMH site are well below the 100 in one million-risk level. Similar levels for this pollutant are also seen in other areas of Michigan.

Arsenic

Arsenic can cause lung cancer. For pollutants that can cause cancer, one way to estimate risk is to consider the additional risk of developing cancer if people breathe a certain pollutant level for their entire life.

Figure 10. Average Arsenic Levels September 2017-September 2018



Results for Metals: Cadmium, Manganese, and Nickel

Cadmium, manganese and nickel were all below their respective health-based levels. The cadmium and manganese levels in 2017-2018 were similar to the previous year whereas nickel levels were lower than the levels measured in the 2016/2017 time period.

RESULTS SUMMARY

At the NMH site, SO_2, lead, and $PM_{2.5}$ were below the federal health-based standards. Cadmium, manganese and nickel were also below the health-based levels used by the State of Michigan. Arsenic levels were above one of the health-based levels for cancer risk at the NMH site and all other sites throughout the state. Levels of $PM_{2.5}$ and lead were similar to other areas of metro Detroit. Lead levels were lower at metro Detroit sites, including NMH, as compared to air monitoring sites where there was a known lead emission source. SO_2 levels at the NMH site were similar to the Marathon air monitors but differed from other sites around the state. More specifically, the NMH levels were higher than background sites but lower than the W. Fort St and Port Huron sites.

Measured pollutant levels from September 2017-September 2018 at the NMH site were similar to the previous year. Overall, this suggests that the air quality stayed about the same. However, since cumulative risk could not be done with the smaller list of pollutants, the level of cumulative risk is unknown.

NEXT STEPS:

The Michigan Department of Environment, Great Lakes, and Energy plan to continue monitoring for SO_2, $PM_{2.5}$, and metals in 2020 at the New Mt Hermon Baptist Church in the 48217 ZIP Code. The agency looks forward to continuing the partnerships with the community.

RESOURCES

Outdoor Air Complaints
EGLE - Air Quality Division, Detroit Field Office: 313-456-4700

USEPA Grosse Ile Office
Emergency Response: 734-692-7600

City of Detroit Emergency Management
www.detroitmi.gov/dhsem | 313-596-2590

Vapor Intrusion and Soil Issues
EGLE Remediation and Redevelopment Division and Materials Management Division, Southeast Michigan District Office: 586-753-3700

Michigan's PFAS Information:
Michigan.gov/PFASResponse

Information on current air quality
DEQMiAir.org/ and www.AirNow.gov/

Air Quality Alerts
EnviroFlash.info/

Detroit Future City-Field Guide to Working with Lots
https://dfc-lots.com/

Information on grant funding for projects
EPA.gov/grants

Public health action plan to address air quality in Detroit
University of Michigan's Community Action to Promote Healthy Environments:
Caphedetroit.sph.umich.edu/

Detroit's Anti-Idling Ordinance
http://www.sdevweb.org/issues/anti-idling/

U.S. EPA Resources

USEPA's MyEnvironment Tool
www3.epa.gov/MyEm/EnvMap/find.html

USEPA's Environmental Justice Screening Tool
EPA.gov/EJScreen

Health Statistics

Michigan.gov/48217Monitoring

- Detroit Asthma Statistics from 2005-2014
- Childhood Lead Testing Results in 2013
- SW Detroit Cancer Study from 1999-2009