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MISSISSIPPI Tobacco Data

THE MISSISSIPPI AIR QUALITY STUDY REPORT

JANUARY 2013

EXECUTIVE SUMMARY



In October through early December, 2012, indoor air quality was assessed in nine Mississippi municipalities. Three of the communities had 100% comprehensive smoke-free ordinances, three had partial smoke-free ordinances, and three had no ordinance regarding smoking.

We used a TSI SidePak AM510 Personal Aerosol Monitor using the protocol developed by the Roswell Park Cancer Institute to measure the concentration of fine particle air pollution, $PM_{2.5}$. Air quality studies typically monitor particles of this size because $PM_{2.5}$ are released in significant amounts from burning cigarettes, are easily inhaled deep into the lungs, and cause a variety of adverse health effects including cardiovascular and respiratory morbidity and death.

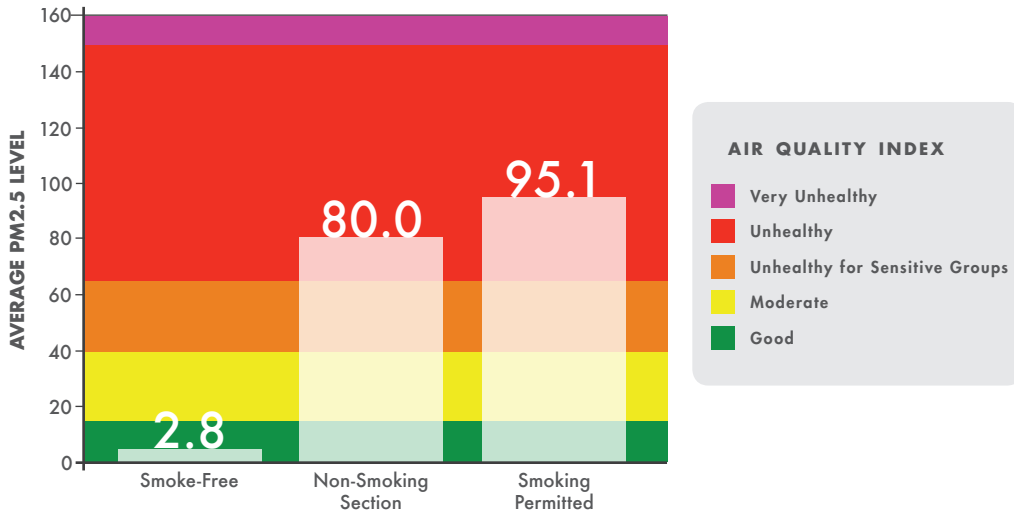


KEY STUDY FINDINGS

- In locations that were completely smoke-free the level of fine particle air pollution was very low, $PM_{2.5} = 2.8 \mu\text{g}/\text{m}^3$.
- In the two nonsmoking sections within locations that allowed smoking the level of fine particle air pollution was $PM_{2.5} = 80.0 \mu\text{g}/\text{m}^3$.
- In the 13 locations with observed smoking, the level of fine particle air pollution was $PM_{2.5} = 95.1 \mu\text{g}/\text{m}^3$.
- In the three casinos with observed indoor smoking the level of fine particle air pollution was $PM_{2.5} = 50.4 \mu\text{g}/\text{m}^3$.
- In the one casino with a smoke-free policy the level of fine particle air pollution was $PM_{2.5} = 1.3 \mu\text{g}/\text{m}^3$.

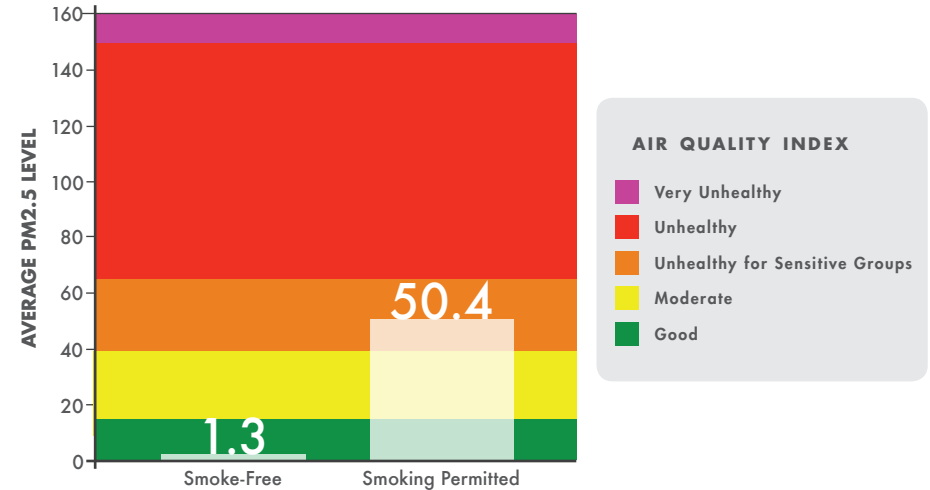


AVERAGE LEVEL OF INDOOR AIR POLLUTION IN RESTAURANTS AND BARS



- The average PM_{2.5} level in smoke-free restaurants & bars was 2.8 µg/m³. The U.S. Environmental Protection Agency classifies levels less than or equal to 15 µg/m³ as **Good**.
- The average PM_{2.5} level in nonsmoking sections of restaurants and bars that also had smoking sections was 80.0 µg/m³. The U.S. EPA classifies levels between 66 and 150 as **Unhealthy** and issues the following health advisory, “People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.”
- The average PM_{2.5} level in restaurants & bars that permitted smoking was 95.1 µg/m³. The U.S. EPA classifies levels between 66 and 150 as **Unhealthy**.

AVERAGE LEVEL OF INDOOR AIR POLLUTION IN CASINOS



- The PM_{2.5} level in the smoke-free casino was 1.3 µg/m³. The U.S. Environmental Protection Agency classifies levels less than or equal to 15 µg/m³ as **Good**.
- The average PM_{2.5} level in the casinos that permitted smoking was 50.4 µg/m³. The U.S. EPA classifies levels between 41 and 65 µg/m³ as **Unhealthy for Sensitive Groups** and issues the following health advisory, “People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.”

TOBACCO SMOKE

According to the Surgeon General, there is no safe level of exposure to secondhand smoke¹. Tobacco smoke contains more than 7,000 chemicals, of which at least 69 cause cancer². Acute risks of secondhand smoke exposure include sudden infant death syndrome, acute respiratory problems, otitis media, increased asthma severity, and myocardial infarction. The numerous chronic and acute harms of tobacco smoke have been documented in many literature reviews^{1,2}.

AMERICAN HEART ASSOCIATION

Tobacco smoke causes about 46,000 heart disease deaths and 3,400 lung cancer deaths. Studies show that the risk of developing heart disease is about 25-30 percent higher among people exposed to environmental tobacco smoke at home or work. Secondhand smoke promotes illness, too. Children of smokers have many more respiratory infections than do children of nonsmokers. Nonsmoking women exposed to tobacco smoke are also more likely to have low-birthweight babies.

AMERICAN CANCER SOCIETY

Secondhand smoke is classified as a “known human carcinogen” (cancer-causing agent) by the US Environmental Protection Agency (EPA), the US National Toxicology Program, and the International Agency for Research on Cancer (IARC), a branch of the World Health Organization.

Tobacco smoke contains more than 7,000 chemical compounds. More than 250 of these chemicals are known to be harmful, and at least 69 are known to cause cancer. SHS has been linked to lung cancer. There is also some evidence suggesting it may be linked with childhood leukemia and cancers of the larynx (voice box), pharynx (throat), brain, bladder, rectum, stomach, and breast.

CURRENT STUDY

Mississippi is one of the few states that has not passed a statewide law regulating smoking in public indoor places. However, several municipalities in this state have passed local ordinances restricting smoking. Currently, 65 municipalities have implemented 100% comprehensive smoke-free ordinances and 12 have passed partial ordinances.

The goal of this study was to measure the level of fine particle air pollution in Mississippi restaurants where smoking was permitted and compare this to smoke-free locations. Specifically, we will examine indoor particle air pollution levels in locations where smoking is not allowed at all, non-smoking areas within locations that allow smoking, and locations where smoking is not allowed in all places.

We also assessed the acute cardiovascular impact of secondhand smoke based upon a clinical investigation of short-term secondhand smoke exposure and acute cardiac morbidity in nonsmokers³.

TOBACCO SMOKE & METHODS

U.S. ENVIRONMENTAL PROTECTION AGENCY

Health studies have shown a significant association between exposure to fine particles and premature death from heart or lung disease. Fine particles can aggravate heart and lung diseases and have been linked to effects such as: cardiovascular symptoms; cardiac arrhythmias; heart attacks; respiratory symptoms; asthma attacks; and bronchitis. These effects can result in increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days. Individuals that may be particularly sensitive to fine particle exposure include people with heart or lung disease, older adults, and children.

METHODS

In October through early December, 2012, indoor air quality was assessed in nine Mississippi municipalities. We applied a purposeful convenience sample rather than a random sample of venues for logistic reasons. Also, a small a random sample of venues would unlikely be representative of the entire population of venues in the state. Three of the communities had 100% comprehensive smoke-free ordinances (Clinton, Jackson, Pearl), three had partial smoke-free ordinances (Gulfport, McComb, Olive Branch), and three had no ordinance regarding smoking (Biloxi, Cleveland, West Point). There were 13 smoke-free restaurants and bars with no observed smoking, two non-smoking sections

within restaurants that allowed smoking (samples were collected in both smoking and nonsmoking sections), 13 smoking-permitted restaurants with observed smoking, one smoke-free casino with no observed smoking, and three smoking-permitted casinos with observed smoking. One pool hall that a local partial smoke-free ordinance allowed to permit smoking after 9pm was also included (samples were collected before and after 9pm).

MICROGRAMS PER CUBIC METER ($\mu\text{G}/\text{M}^3$)

Air quality is assessed based on Particulate Matter (PM). The size of particles is directly linked to their potential for causing health problems. Very small particles generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Air quality levels are defined as the mass of particulate matter ≤ 2.5 microns in diameter in a volume of air: micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). A microgram is one millionth of a gram. A cubic meter (approximately 39" X 39" X 39") describes a volume of air that is about the size of a washing machine.

METHODS

We used a TSI SidePak Monitor using the protocol developed by the Roswell Park Cancer Institute⁴ to measure the concentration of fine particle air pollution. The specific class of RSPs monitored was particulate matter ≤ 2.5 microns in diameter ($PM_{2.5}$), a commonly used marker for tobacco smoke exposure^{5,6}. Air quality studies typically monitor particles of this size because $PM_{2.5}$ are released in significant amounts from burning cigarettes, are easily inhaled deep into the lungs, and cause a variety of adverse health effects including cardiovascular and respiratory morbidity and death.

THE ROSWELL PARK CANCER INSTITUTE PROTOCOL⁷

The number of people inside the venue and the number of burning cigarettes were recorded during sampling. These observations were averaged over the time inside the venue to determine the average number of people on the premises and the average number of burning cigarettes. Room dimensions were also determined using a combination a counting of construction materials of a known size such as floor tiles or estimation. Room volumes were calculated from these dimensions. The active smoker density was calculated by dividing the average number of burning

cigarettes by the volume of the room in meters.

A TSI SidePak AM510 Personal Aerosol Monitor (TSI, Inc., St. Paul, MN) was used to sample and record the levels of respirable suspended particles in the air. The SidePak uses a built-in sampling pump to draw air through the device where the particulate matter in the air scatters the light from a laser. This portable light-scattering aerosol monitor was fitted with a 2.5 μm impactor in order to measure the concentration of particulate matter with a mass-median aerodynamic diameter less than or equal to 2.5 μm , or $PM_{2.5}$. Tobacco smoke particles are almost exclusively less than 2.5 μm with a mass-median diameter of 0.2 μm . The Sidepak was used with a calibration factor setting of 0.32, suitable for secondhand smoke. In addition, the SidePak was zero-calibrated prior to each use by attaching a HEPA filter according to the manufacturer's specifications.

Sampling was discreet in order not to disturb the occupants' normal behavior. For each venue, the first and last minute of logged data were removed because they are averaged with outdoor and entryway air. The remaining data points were averaged to provide an average $PM_{2.5}$ concentration within the venue.

RESULTS

PM_{2.5} Levels

The overall average PM_{2.5} level in smoking-permitted restaurants and bars was 95.1 µg/m³ (range: 17.1–173.5). The average PM_{2.5} level in nonsmoking areas of restaurants and bars with designated smoking areas was 80.0 µg/m³ (range: 34.0–126.0), and the average PM_{2.5} level in smoke-free restaurants and bars was 2.8 µg/m³ (range: 0.6–10.4). The average PM_{2.5} level in smoking permitted casinos was 50.4 µg/m³ (range: 44.9–57.9), whereas the PM_{2.5} level in the state’s only smoke-free casino was 1.3 µg/m³. Within a pool hall that a partial local ordinance permitted to allow indoor smoking after 9pm, the PM_{2.5} level was 245.3 µg/m³ before 9pm and 104.2 µg/m³ after 9pm (indoor smoking was observed before 9pm, despite the local ordinance). A summary of each location visited is shown in Table 1. Venue summaries for restaurants and bars, casinos, and the pool hall are provided in Figures 1-3. The real-time charts showing PM_{2.5} levels in each venue sampled are presented in the Appendix. These charts reveal the following results:

- Very low levels of PM_{2.5} were observed in smoke-free venues;
- Unhealthy levels of PM_{2.5} were detected in nonsmoking sections of smoking-permitted restaurants;
- Despite high ceilings and filtration systems; levels of PM_{2.5} in smoking-permitted casinos exceeded the U.S. Environmental Protection Agency’s threshold for Unhealthy for Sensitive Groups Air Quality; and
- Peak levels in smoking-permitted venues often reach levels substantially higher than the average level.

Estimated decrease in heart rate variability and corresponding increase in cardiac mortality risk

We estimated the average decrement in heart rate variability for patrons and workers for 1–2 hours of exposure based on a clinical investigation of short-term secondhand smoke exposure and acute cardiac morbidity in nonsmokers³. In this investigation, researchers exposed adult nonsmokers, aged 22–76, for 1.75 hours to an average increase of particulate matter due to secondhand smoke. Their study found that an

RESULTS

average exposure to particulate from secondhand smoke caused a decrement in heart rate variability of 2.3% per 10 $\mu\text{g}/\text{m}^3$ increase beyond outdoor levels.

We observed outdoor $\text{PM}_{2.5}$ levels to be 4.1 $\mu\text{g}/\text{m}^3$ and calculated the difference between the indoor and outdoor levels of $\text{PM}_{2.5}$ concentrations for venues with tobacco smoke. The estimated average decrement in heart rate variability for patrons and workers in these venues was (indoor - outdoor $\mu\text{g}/\text{m}^3$) was multiplied by (2.3%/10 $\mu\text{g}/\text{m}^3$) to estimate increased risk for 1–2 hours of exposure.

- Nonsmoking sections within smoking-permitted restaurants and bars: 17% for 1–2 hours of exposure.
- Smoking-permitted restaurants and bars: 21% for 1–2 hours of exposure.
- Smoking-permitted casinos: 11% for 1–2 hours of exposure.

Annual exposure estimates and the annual EPA $\text{PM}_{2.5}$ exposure standard

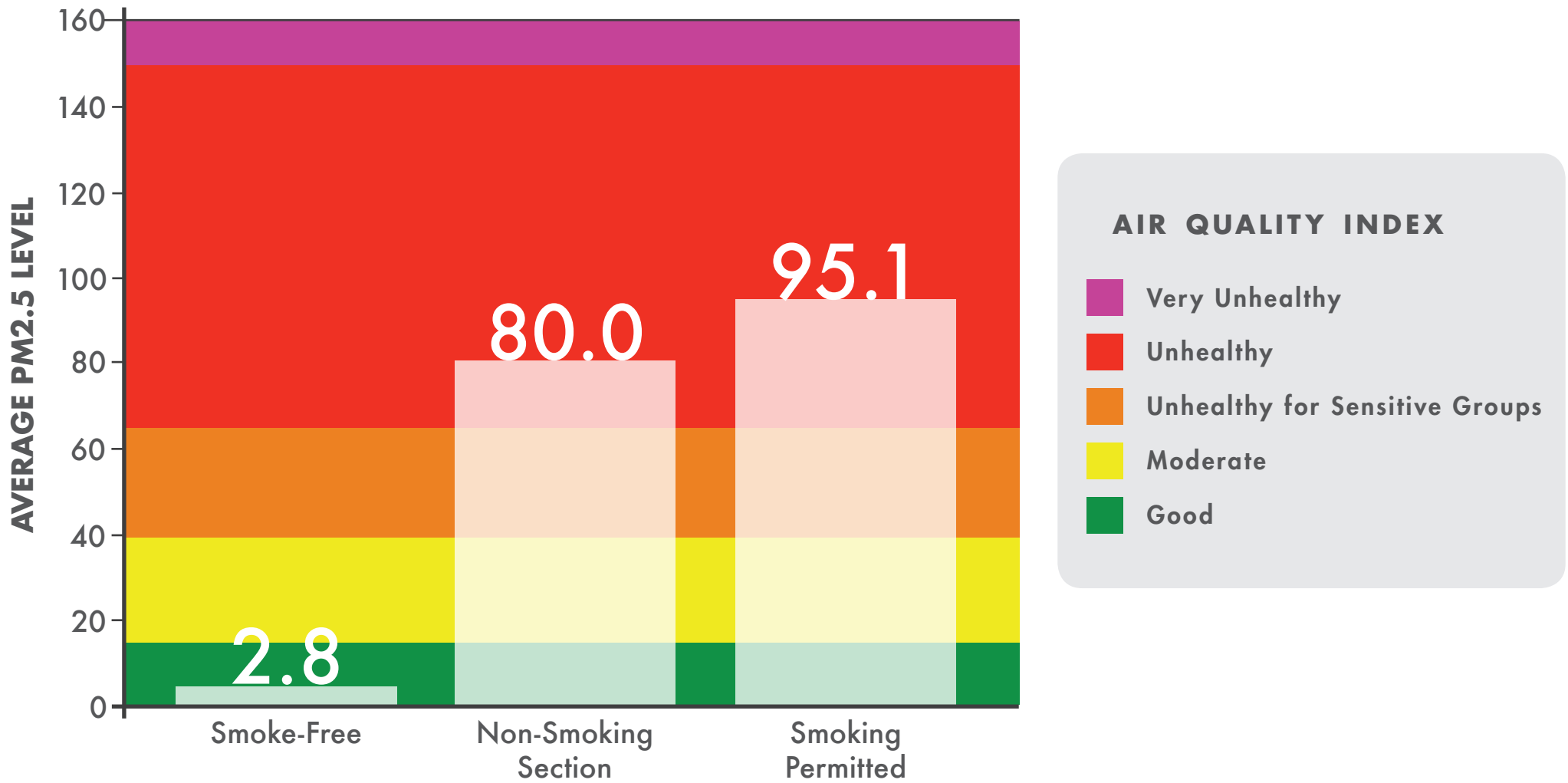
The EPA has set limits of 12 $\mu\text{g}/\text{m}^3$ as the average annual level of $\text{PM}_{2.5}$ exposure⁸. In order to compare the findings in this study with the annual EPA $\text{PM}_{2.5}$

exposure standard, we assumed that a full-time employee in the locations sampled that allow smoking works 8 hours, 250 days a year, is exposed to 86 $\mu\text{g}/\text{m}^3$ (the average level in the sites with smoking) on the job, and is exposed only to background particle levels of 4.1 $\mu\text{g}/\text{m}^3$ during non-work times. For a full-time employee in a smoking-permitted venue, their average annual $\text{PM}_{2.5}$ exposure is 23 $\mu\text{g}/\text{m}^3$. Thus, the EPA average annual $\text{PM}_{2.5}$ limit is exceeded by 1.9 times due to their occupational exposure.

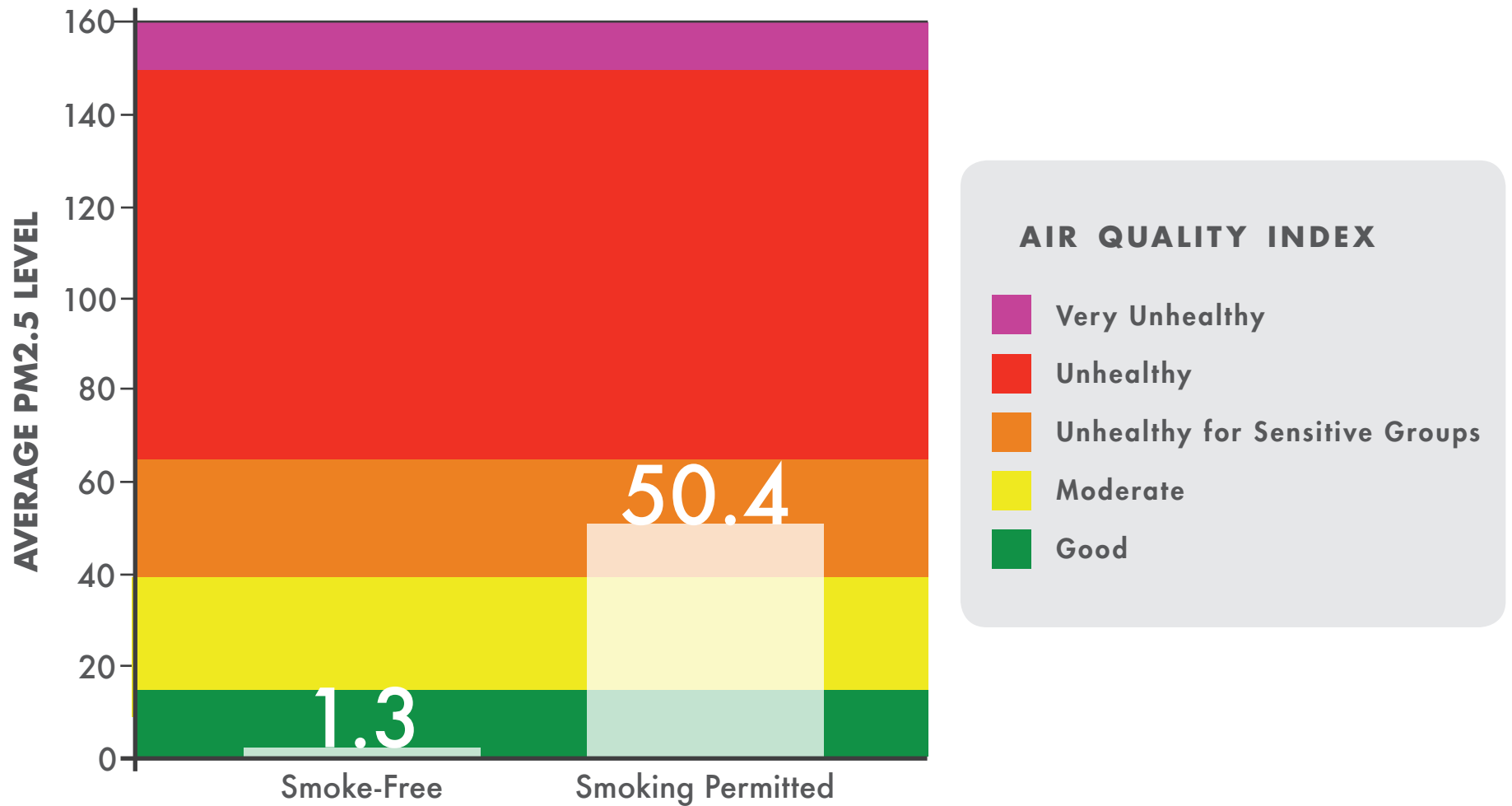
RESULTS

	VENUE NUMBER	SIZE	AVG NUMBER OF PEOPLE	AVG NUMBER OF BURNING CIGARETTES	AVG SMOKING DENSITY	AVG PM 2.5 LEVEL
smoke-free restaurants & bars →	1	557	60	0	0.00	3.7
	2	360	30	0	0.00	10.4
	3	446	57	0	0.00	0.6
	4	483	15	0	0.00	1.3
	5	232	12	0	0.00	3.4
	6	316	10	0	0.00	2.8
	7	418	52	0	0.00	1.0
	8	240	6	0	0.00	2.3
	9	552	40	0	0.00	1.6
	10	362	16	0	0.00	3.8
	11	168	10	0	0.00	2.0
	12	119	24	0	0.00	1.6
	13	518	72	0	0.00	1.4
	AVERAGE (N=13)	367	31	0	0.00	2.8
non-smoking section of restaurants & bars →	14	725	38	0	0.00	34.0
	15	480	30	6	1.25	126.0
	AVERAGE (N=2)	602	34	3	0.63	80.0
smoking permitted restaurants & bars →	16	560	42	11	1.96	157.2
	17	130	13	3	2.31	75.4
	18	223	11	3	1.35	21.7
	19	1,500	19	8	0.53	17.1
	14	725	38	5	0.69	134.0
	20	500	10	3	0.60	25.0
	21	1,449	33	10	0.69	127.0
	22	360	13	5	1.39	116.0
	23	1,500	40	8	0.53	75.5
	15	480	30	3	0.63	51.9
	24	650	28	5	0.77	96.2
	25	232	11	6	2.59	173.5
	26	464	10	5	1.08	166.3
	AVERAGE (N=13)	675	23	6	0.85	95.1
smoking permitted casinos →	27	7,786	250	3	0.04	48.4
	28	62,851	250	4	0.01	44.9
	29	16,723	350	6	0.04	57.9
	AVERAGE (N=3)	29,120	283	4	0.03	50.4
smoke-free casino pool hall →	30	9,290	300	0	0.00	1.3
	31	150	15	8	5.33	245.3
	31	150	20	9	6.00	104.2

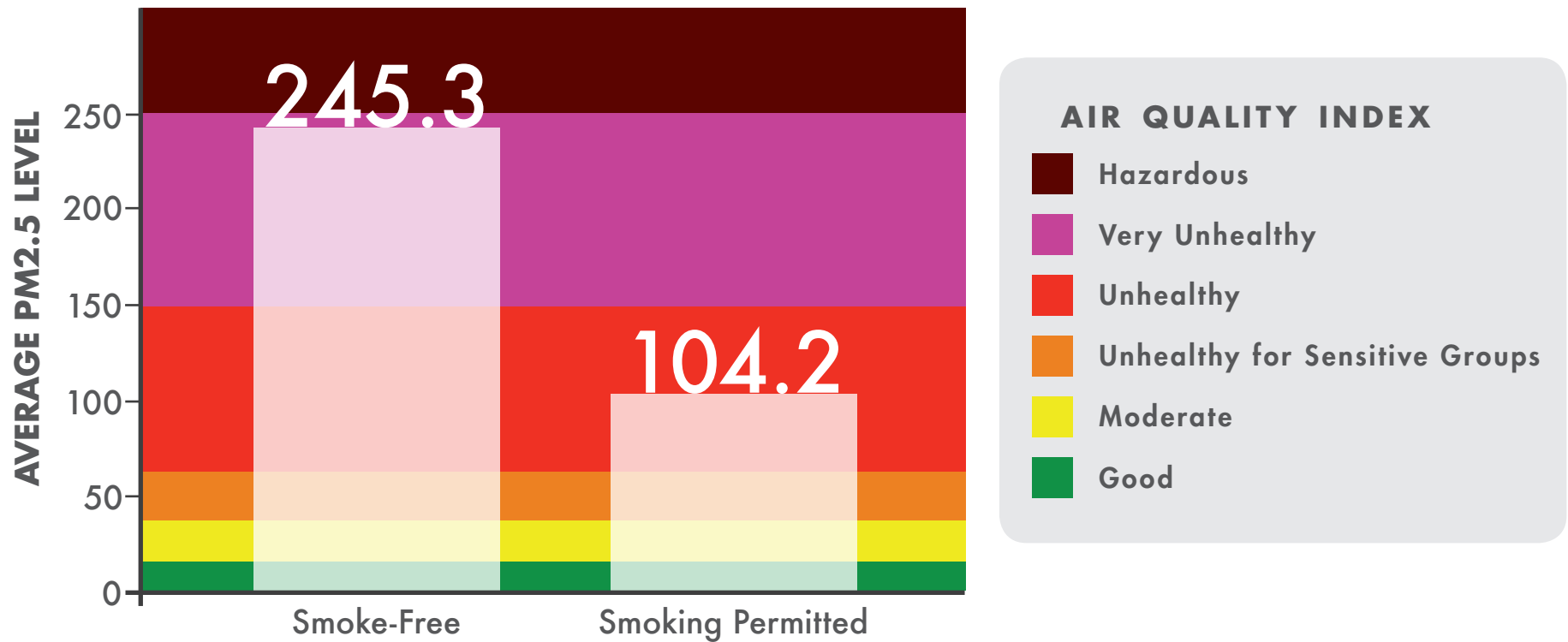
AVERAGE LEVEL OF INDOOR AIR POLLUTION IN RESTAURANTS AND BARS



AVERAGE LEVEL OF INDOOR AIR POLLUTION IN CASINOS



AVERAGE LEVEL OF INDOOR AIR POLLUTION IN OLIVE BRANCH POOL HALL



CONCLUSION

This study demonstrates that employees and patrons in Mississippi venues permitting indoor smoking are exposed to harmful levels of indoor air pollution resulting from indoor smoking. A comprehensive smoke-free air policy that prohibits indoor smoking in all indoor places is the only proven means to eliminate this exposure to toxic tobacco smoke pollution. This type of policy will result in improved quality of life and health outcomes for Mississippi workers and residents.



ACKNOWLEDGEMENTS

The study was funded by the American Lung Association Gulf-Plains Region. The protocol for this study and the report approach were developed by the Roswell Park Cancer Institute (RPCI).

PRINCIPAL INVESTIGATOR Dr. Robert McMillen, Ph.D

DATA COLLECTOR Ms. Lauren Colvin, MS

GRAPHIC DESIGNER Mrs. Miranda Robertson

PHOTOGRAPHER shutterstock.com, mexrix

REFERENCES

REFERENCES

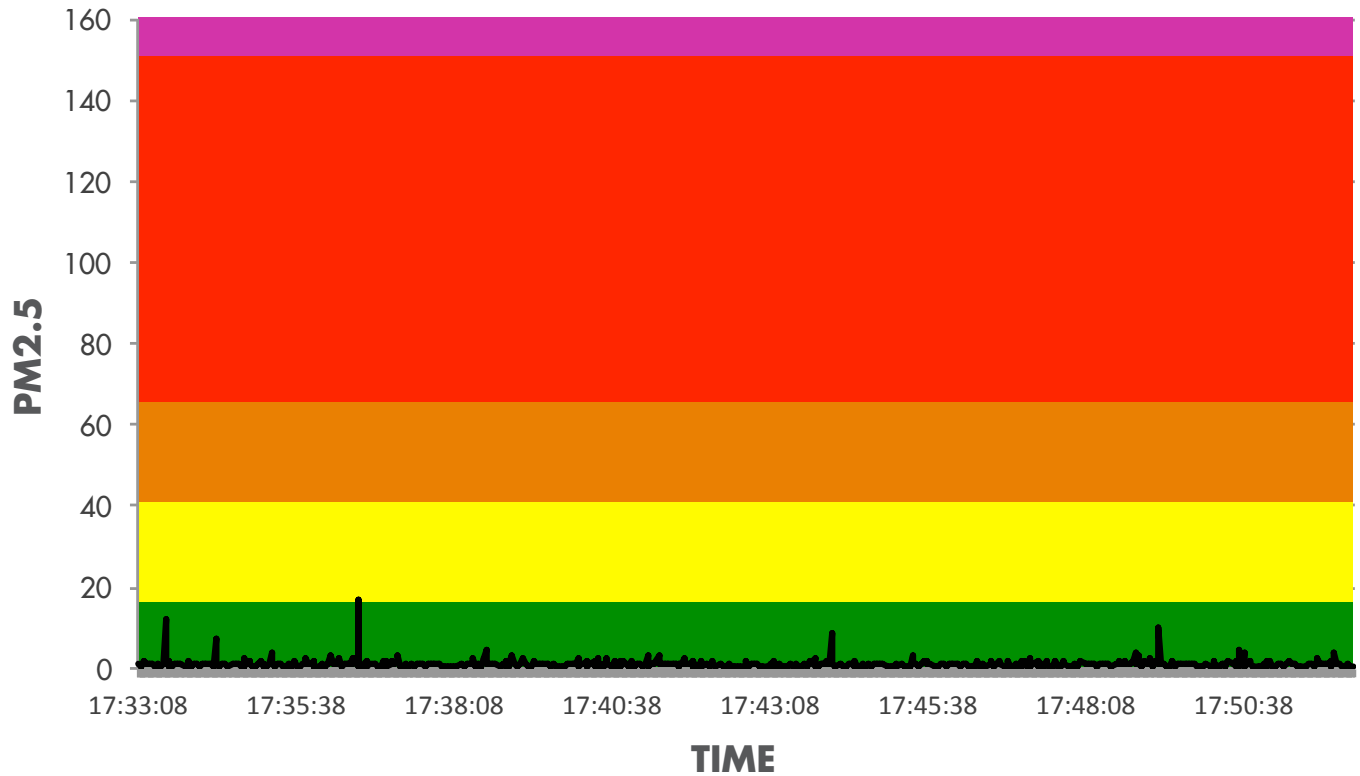
1. U.S. Department of Health and Human Services. *The health consequences of involuntary exposure to secondhand smoke: a report of the Surgeon General*. 2006.
2. U.S. Department of Health and Human Services. *How tobacco smoke causes disease: the biology and behavioral basis from smoking-attributable disease - a report of the Surgeon General*. 2010.
3. Pope, C.A., Eatough, D.J., Gold, D.R., Pang, Y., Nielsen, K.R., Nath, P., et al., 2001. Acute exposure to environmental tobacco smoke and heart rate variability. *Environmental Health Perspectives*. 109, 711–716.
4. Travers M. *Indoor Air Monitoring Protocol*. Roswell Park Cancer Institute. 2006.
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6. CDC. Indoor air quality in hospitality venues before and after implementation of a clean indoor air law—western New York, 2003. *MMWR* 2004;53:1038–41.
7. Travers MJ, Vogl L. Fayetteville, Arkansas air quality monitoring study. Roswell Park Cancer Institute. 2011.
8. U.S. Environmental Protection Agency (2012). *National Ambient Air Quality Standards for Particulate Matter*. <http://www.epa.gov/air/particlepollution/2012/finalrule.pdf>

APPENDIX

US EPA AIR QUALITY INDEX

Air Quality	PM _{2.5} (µg/m ³)	Health Advisory
Hazardous	≥251	People with heart or lung disease, older adults, and children should remain indoors and keep activity levels low. Everyone else should avoid all physical activity outdoors.
Very Unhealthy	151-250	People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.
Unhealthy	66-150	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
Unhealthy for Sensitive Groups	41-65	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
Moderate	16-40	Unusually sensitive people should consider reducing prolonged or heavy exertion.
Good	≤15	None.

SMOKE-FREE | CLINTON RESTAURANT



AIR QUALITY INDEX

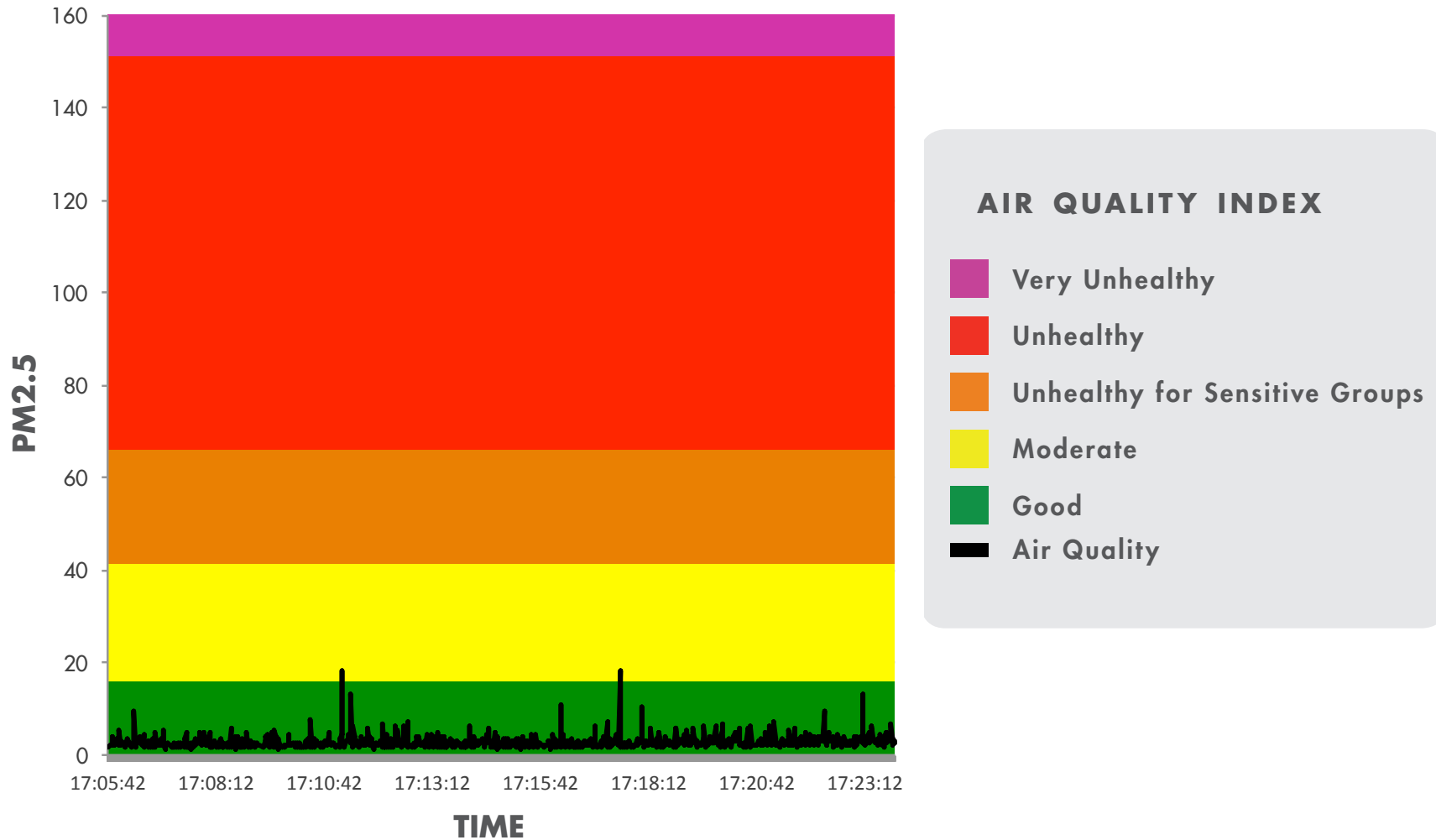
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 1.0 µg/m3

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 7

SMOKE-FREE | CLINTON RESTAURANT

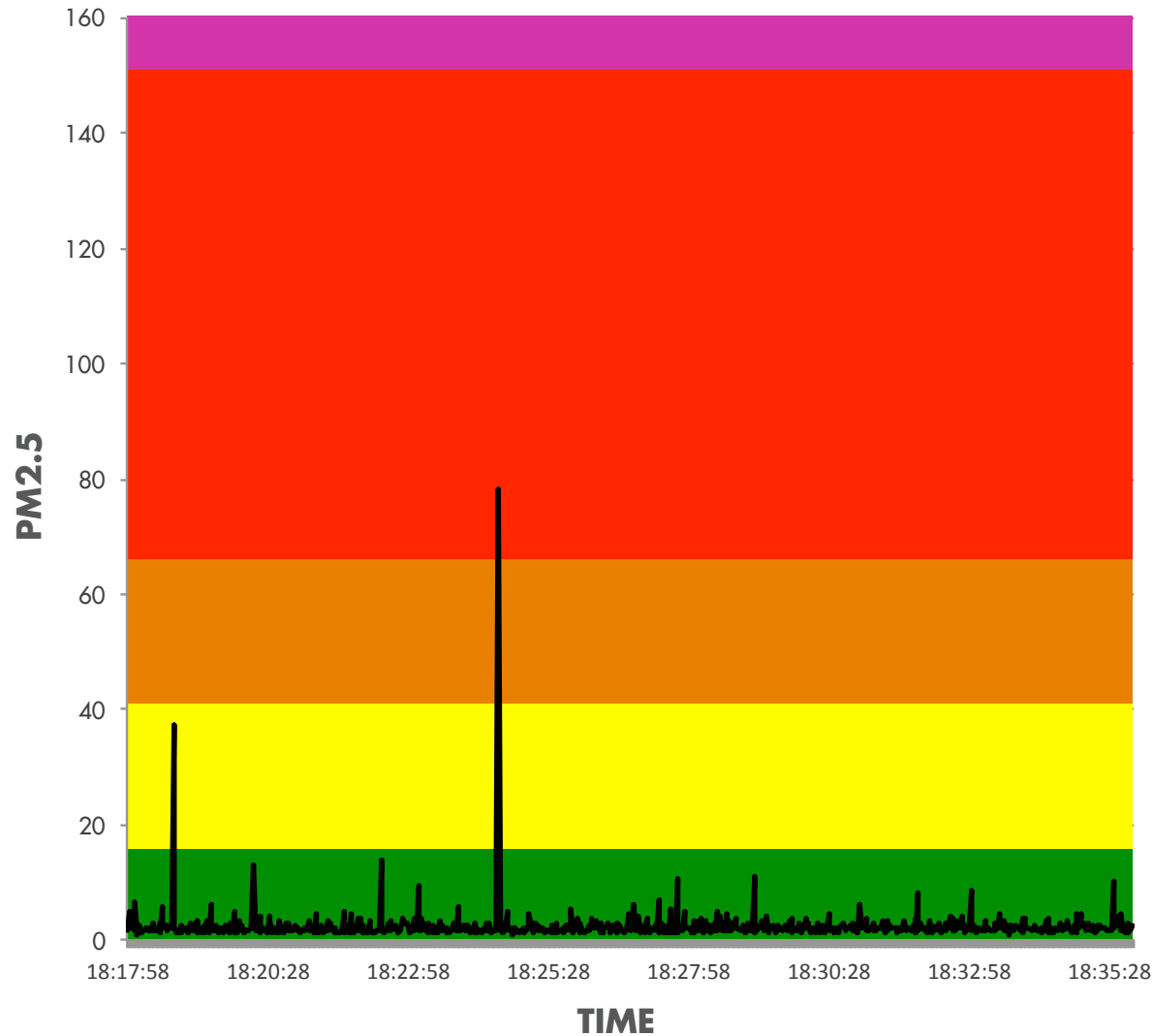


PM2.5 = 2.8 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 6

SMOKE-FREE | CLINTON RESTAURANT



AIR QUALITY INDEX

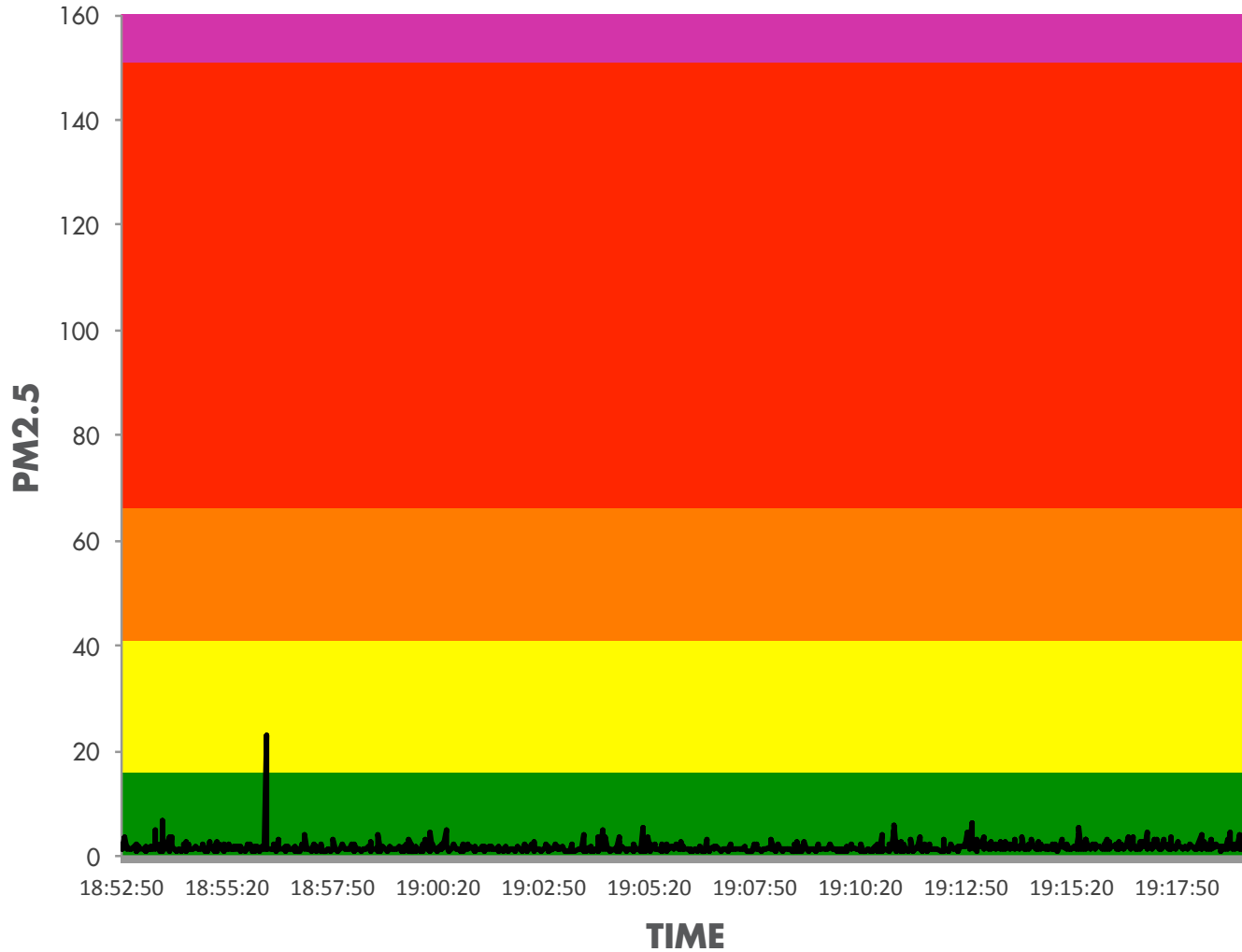
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 2.3 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 8

SMOKE-FREE | GULFPORT RESTAURANT



AIR QUALITY INDEX

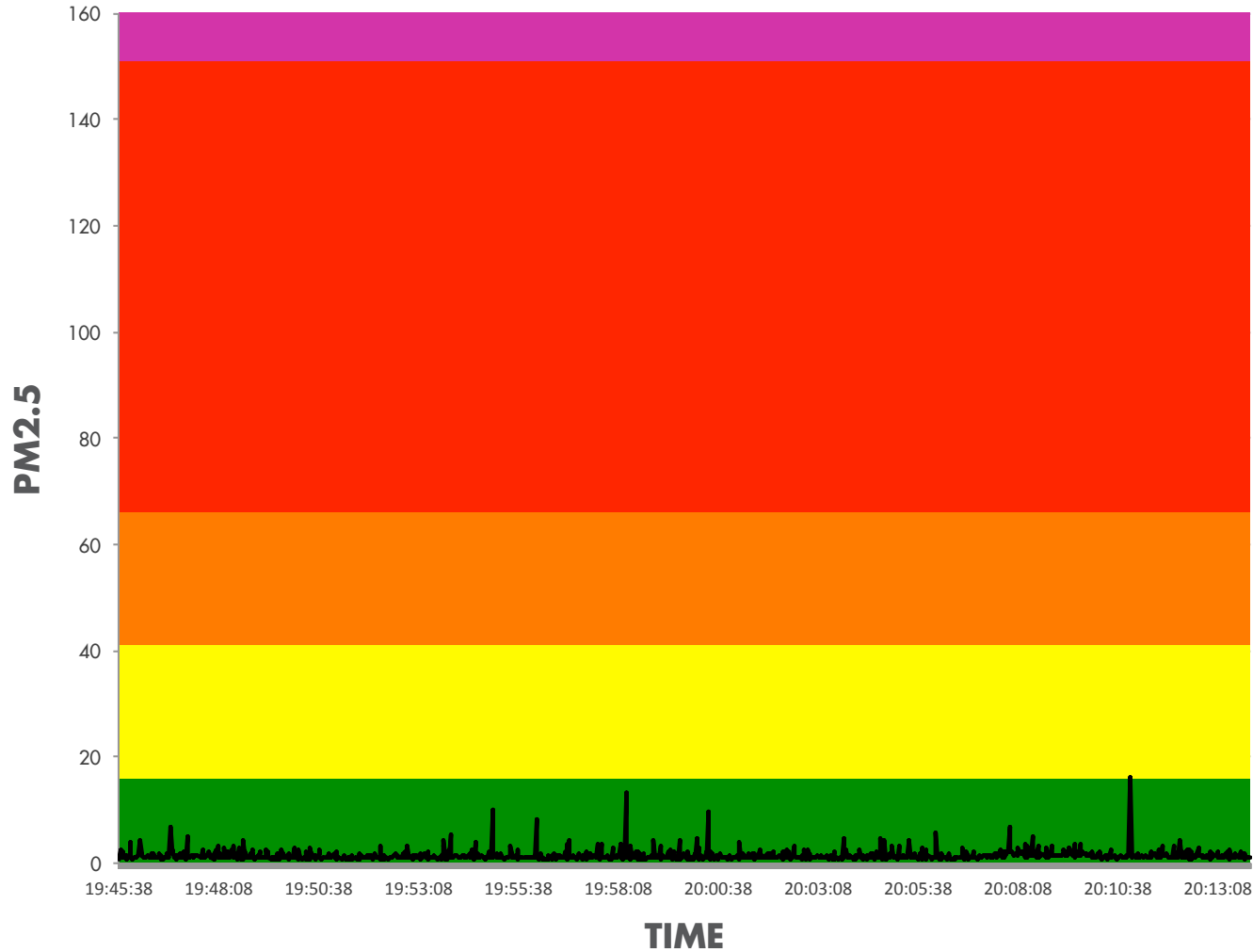
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 1.6 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 2

SMOKE-FREE | GULFPORT RESTAURANT



AIR QUALITY INDEX

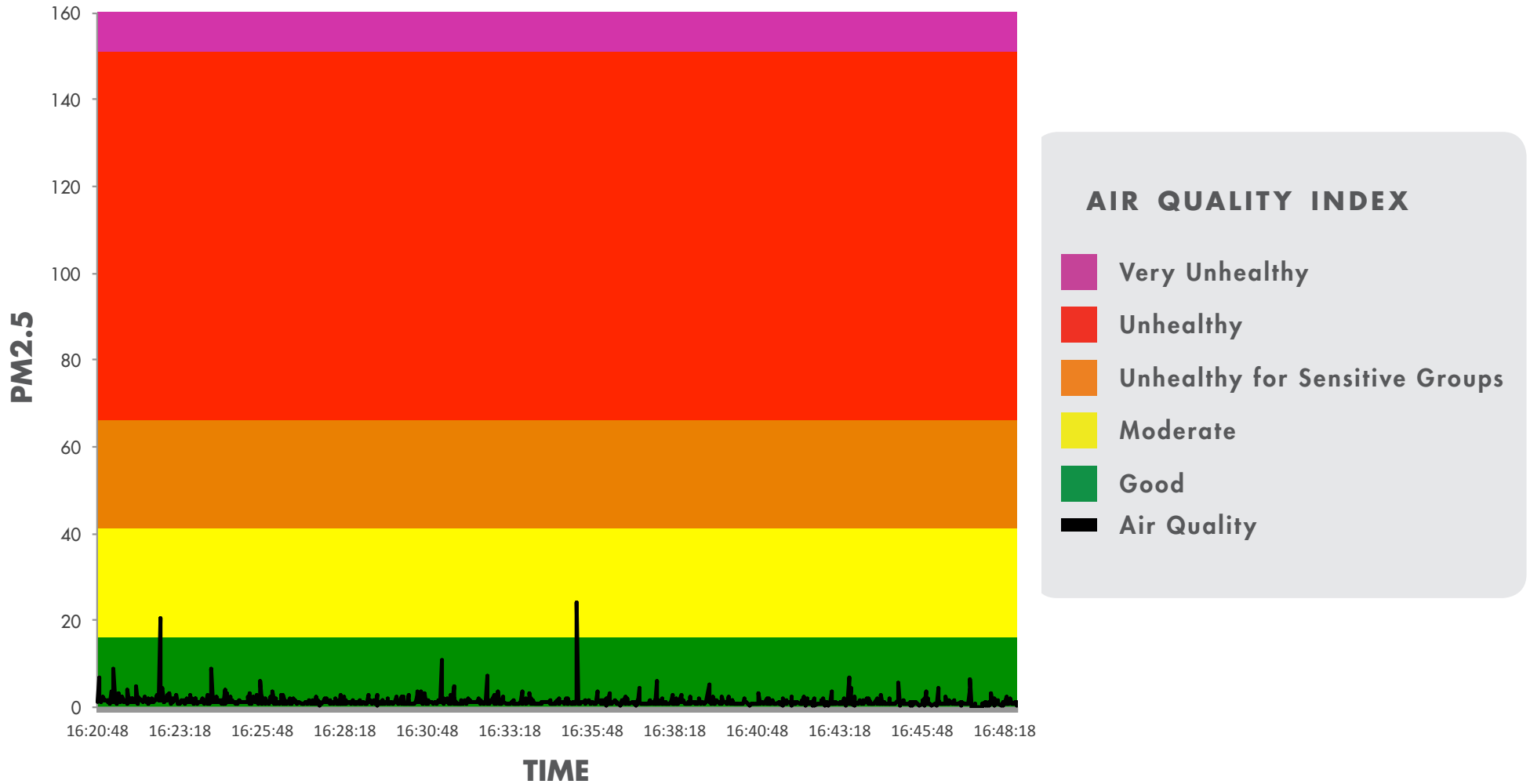
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 1.4 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 13

SMOKE-FREE | JACKSON RESTAURANT

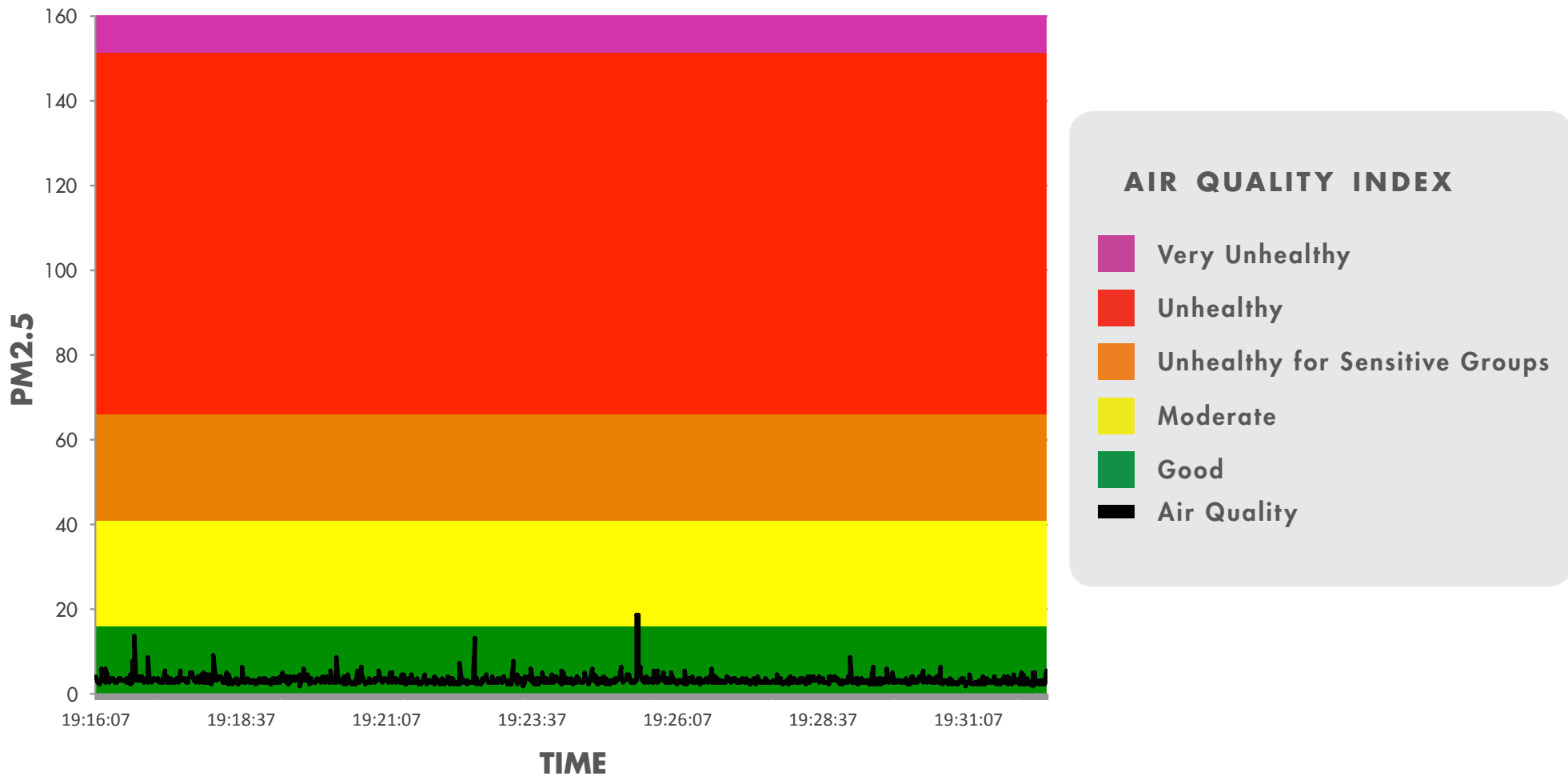


PM2.5 = 1.3 µg/m³

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 4

SMOKE-FREE | JACKSON RESTAURANT

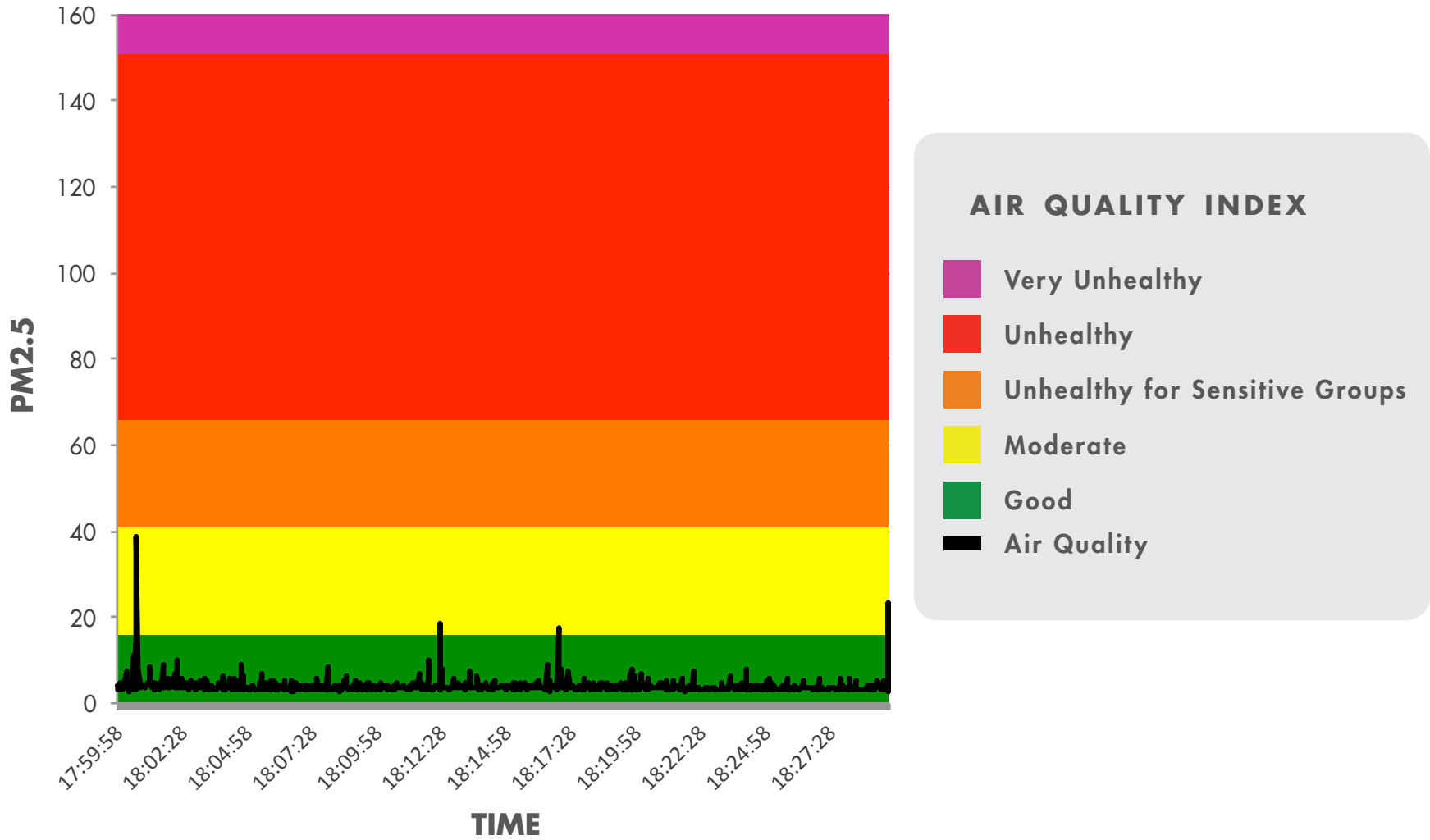


PM2.5 = 3.4 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 5

SMOKE-FREE | McCOMB RESTAURANT

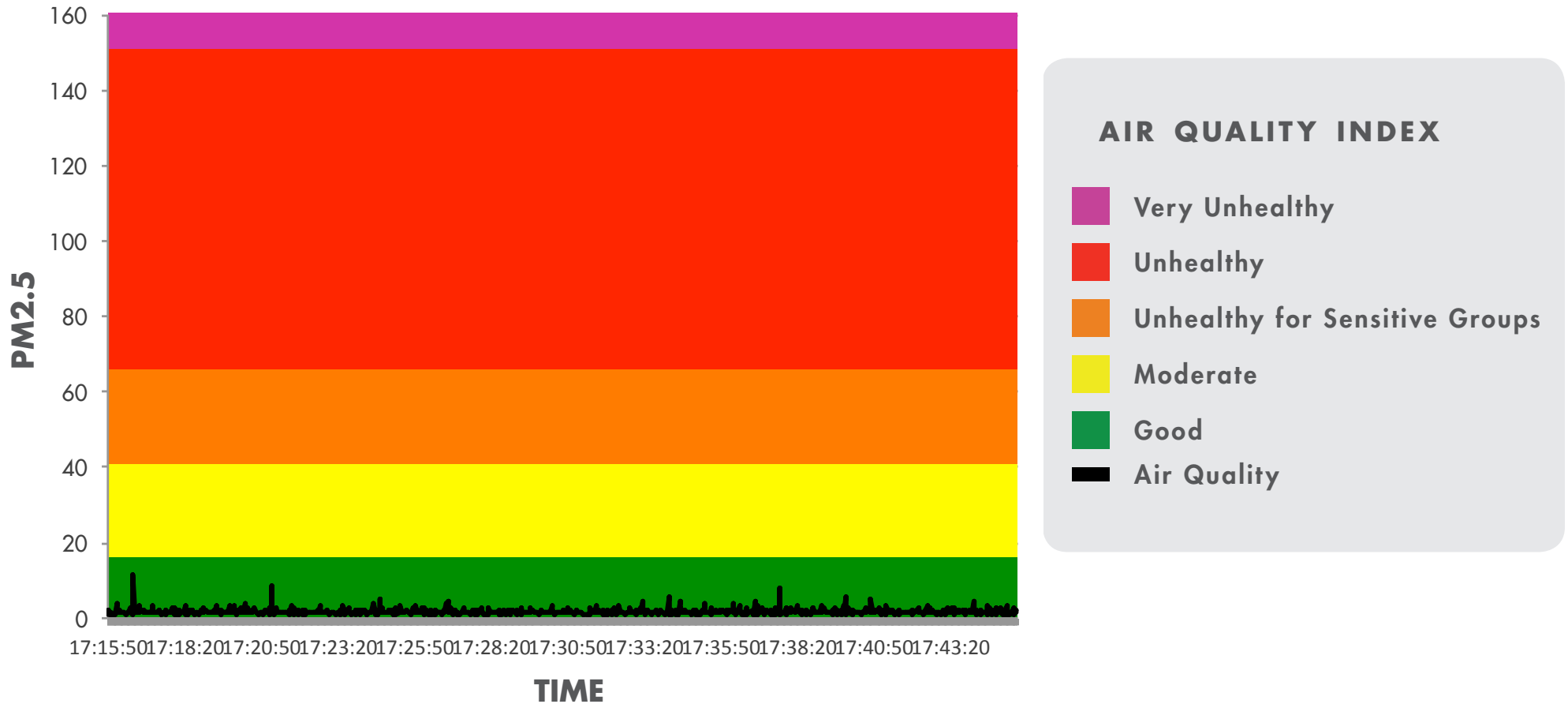


PM2.5 = 3.8 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 10

SMOKE-FREE | McCOMB RESTAURANT

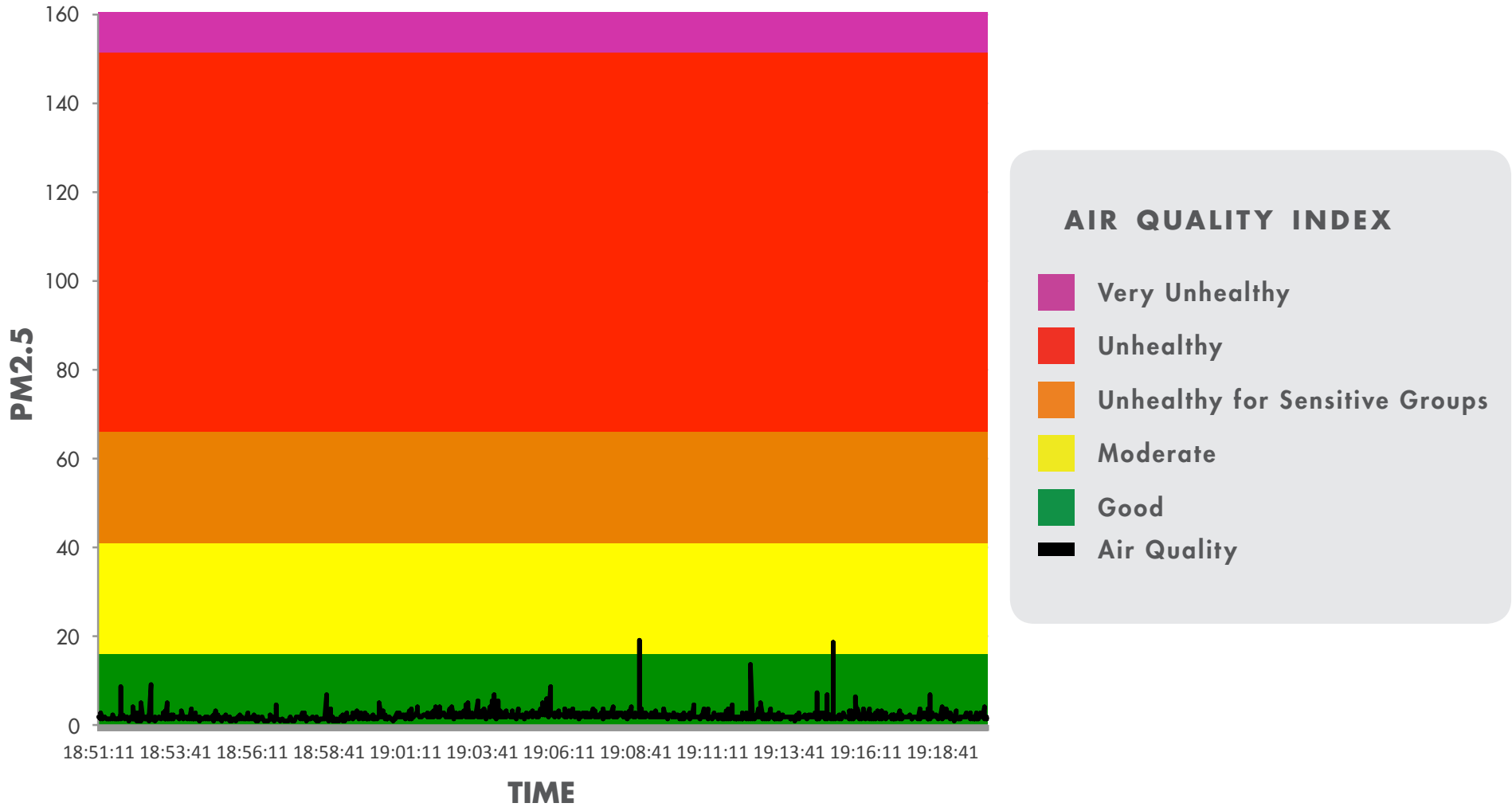


PM2.5 = 1.6 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 9

SMOKE-FREE | McCOMB RESTAURANT

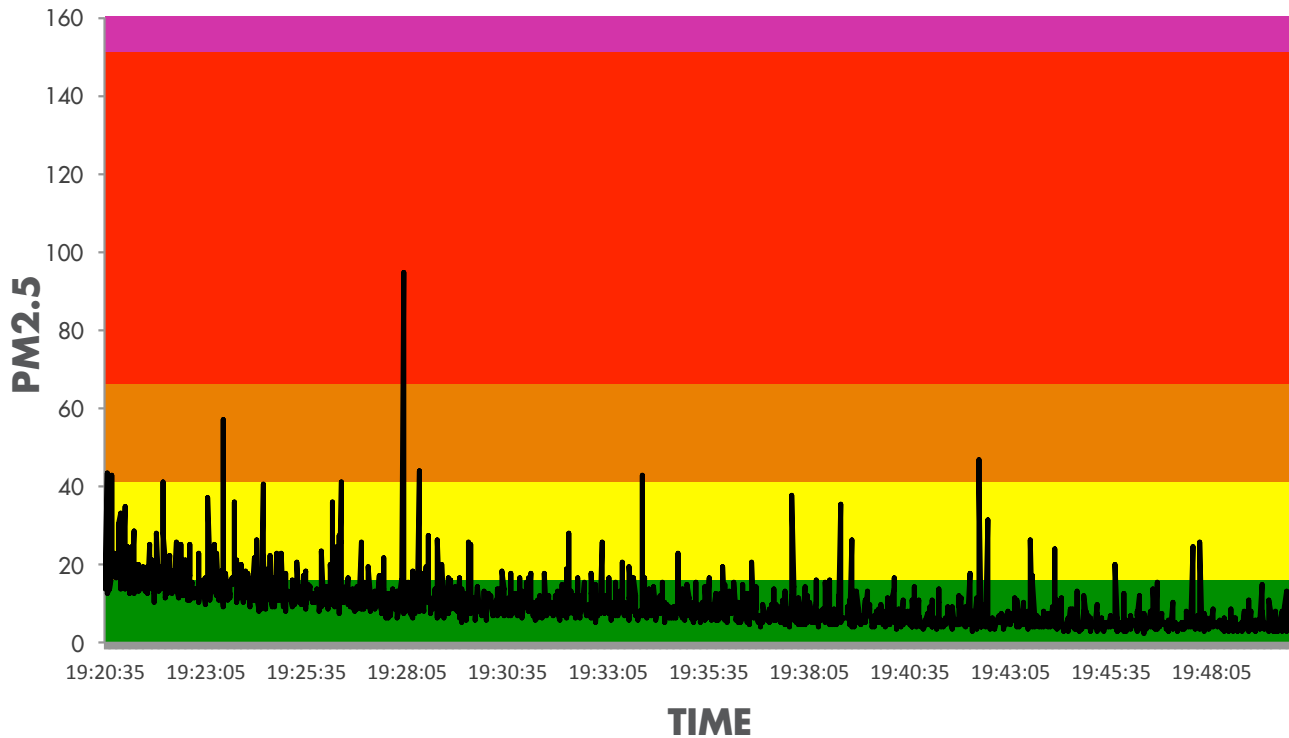


PM2.5 = 2.0 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 11

SMOKE-FREE | PEARL RESTAURANT



AIR QUALITY INDEX

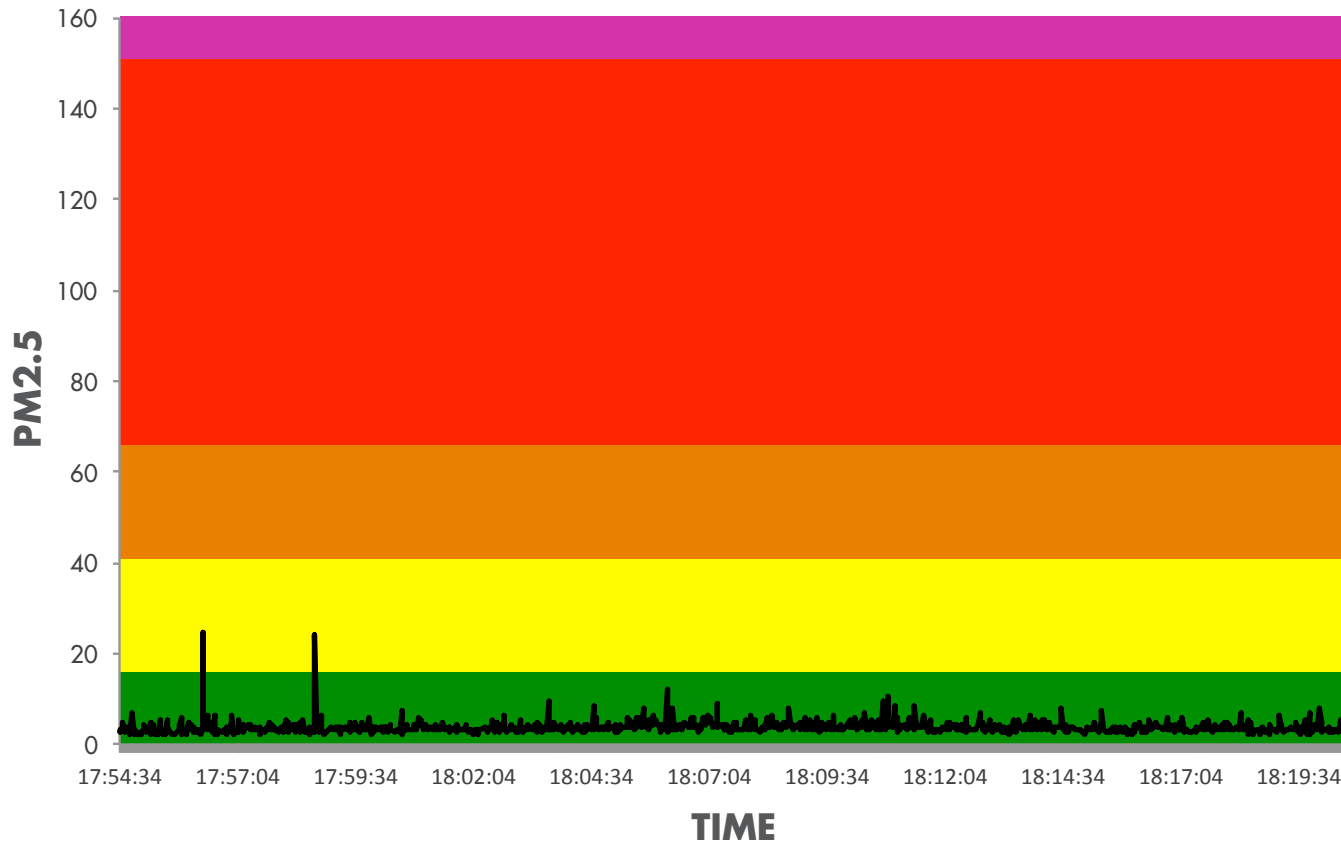
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 10.4 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 2

SMOKE-FREE | PEARL RESTAURANT



AIR QUALITY INDEX

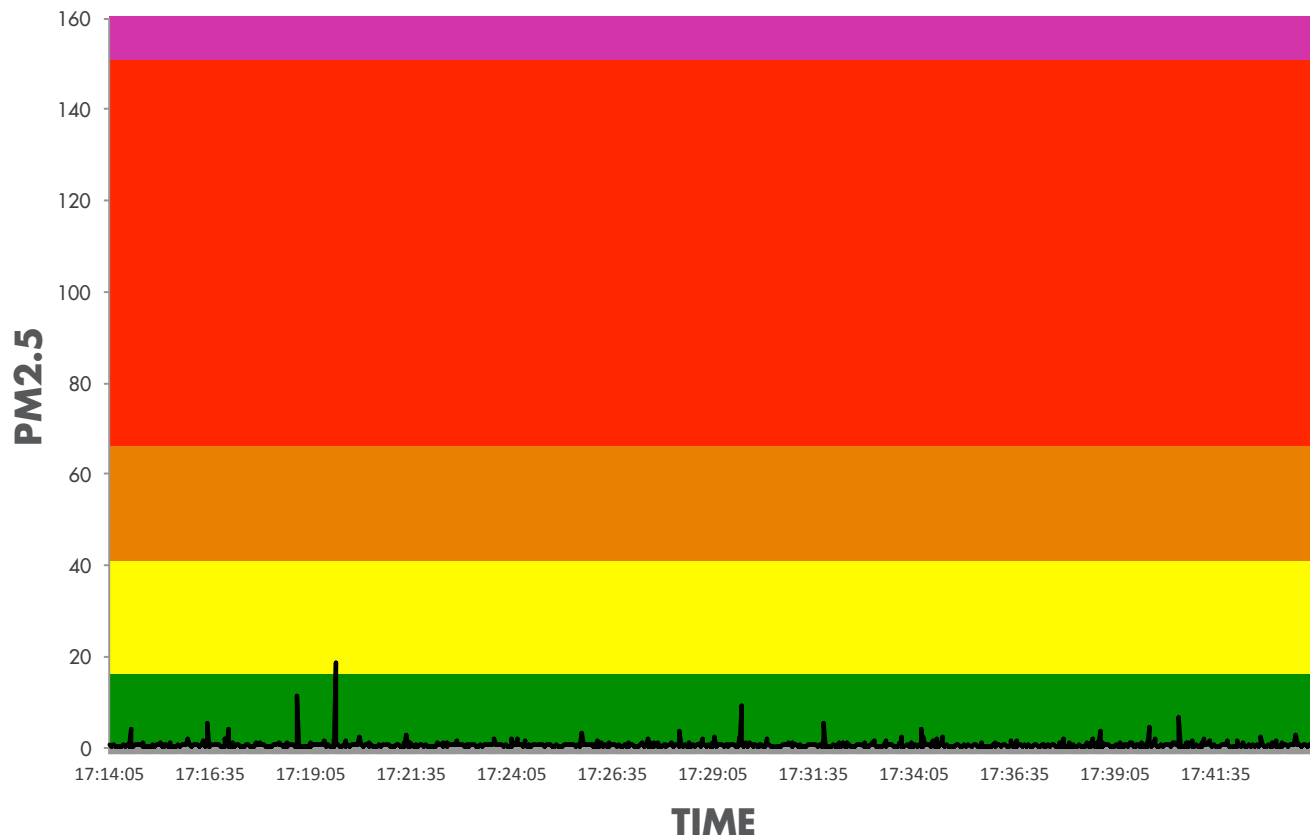
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 3.7 µg/m³

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 1

SMOKE-FREE | PEARL RESTAURANT



AIR QUALITY INDEX

- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

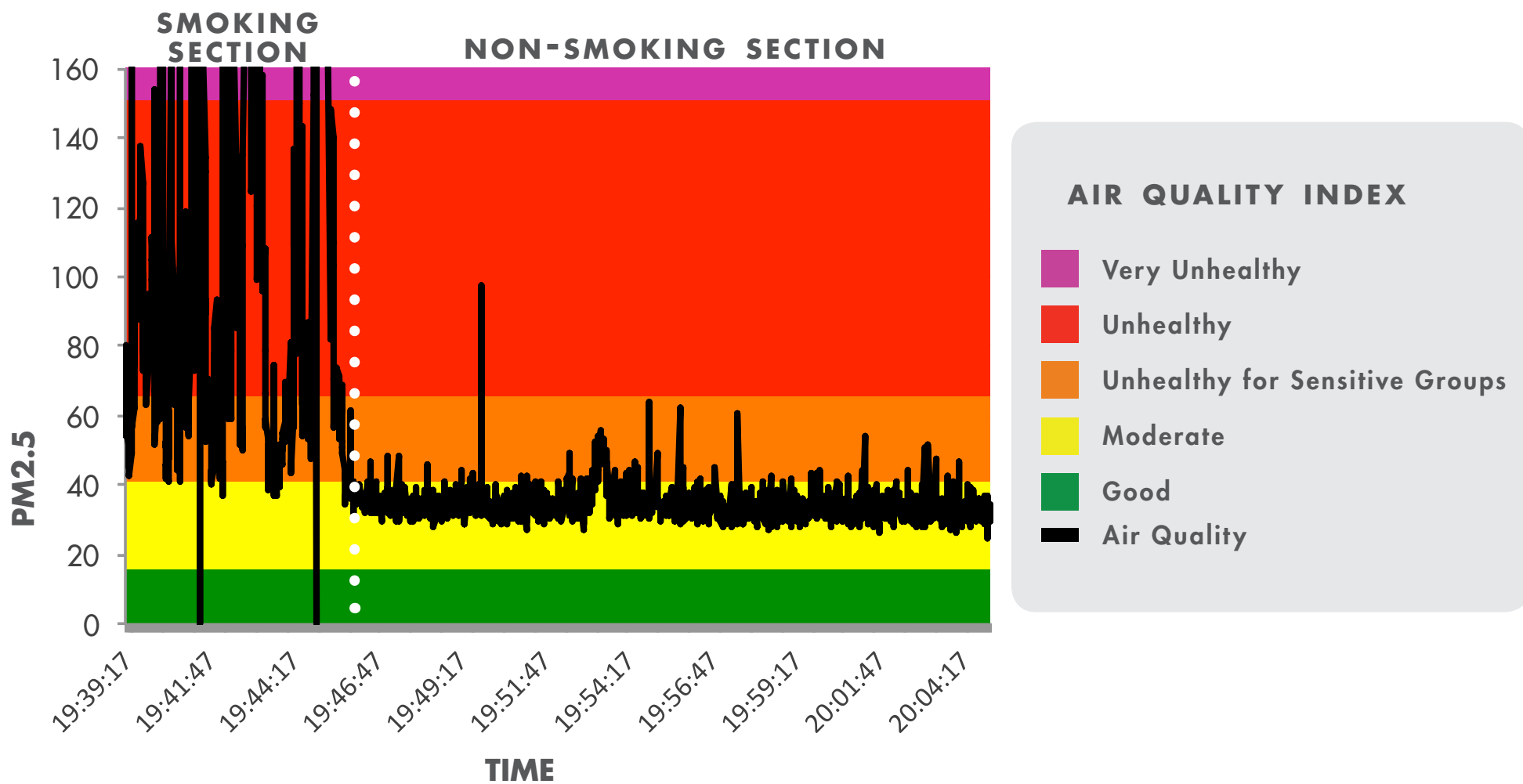
PM2.5 = 0.6 $\mu\text{g}/\text{m}^3$

This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.

→ venue 3

SMOKING AND NON-SMOKING

CLEVELAND RESTAURANT



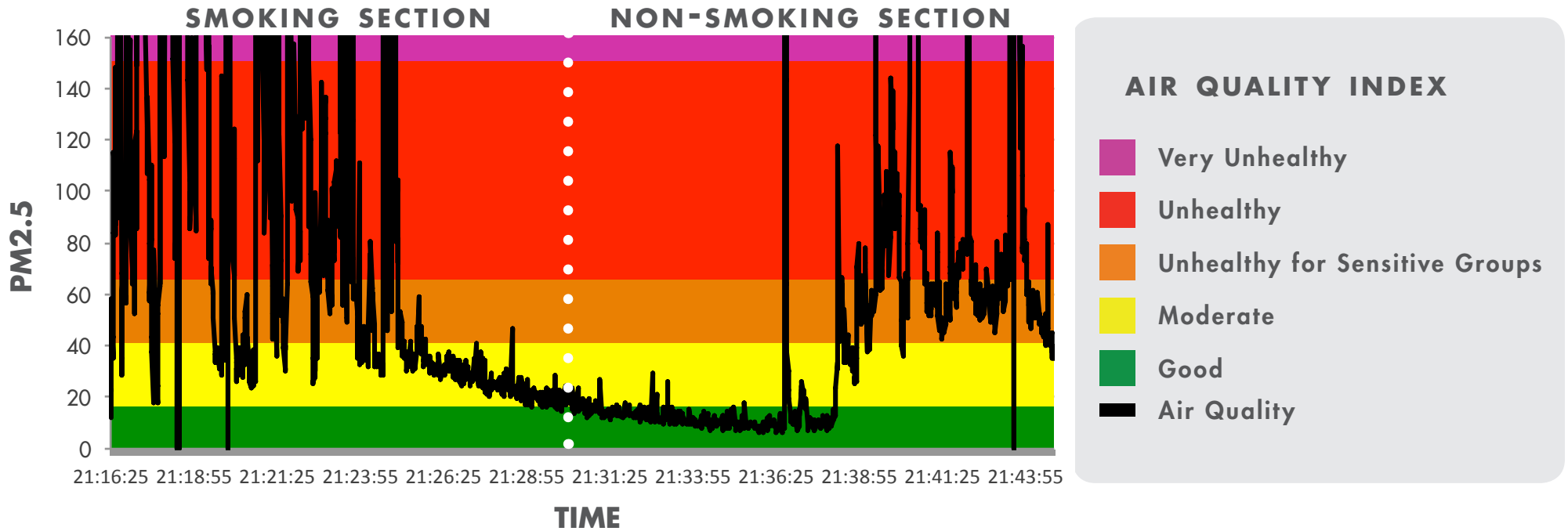
AIR QUALITY INDEX

- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

Smoking: PM2.5 = 134.0 $\mu\text{g}/\text{m}^3$
 This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*.
 → venue 14

Non-Smoking: PM2.5 = 34.0 $\mu\text{g}/\text{m}^3$
 This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Moderate Air Quality*.
 → venue 14

SMOKING AND NON-SMOKING | WEST POINT RESTAURANT

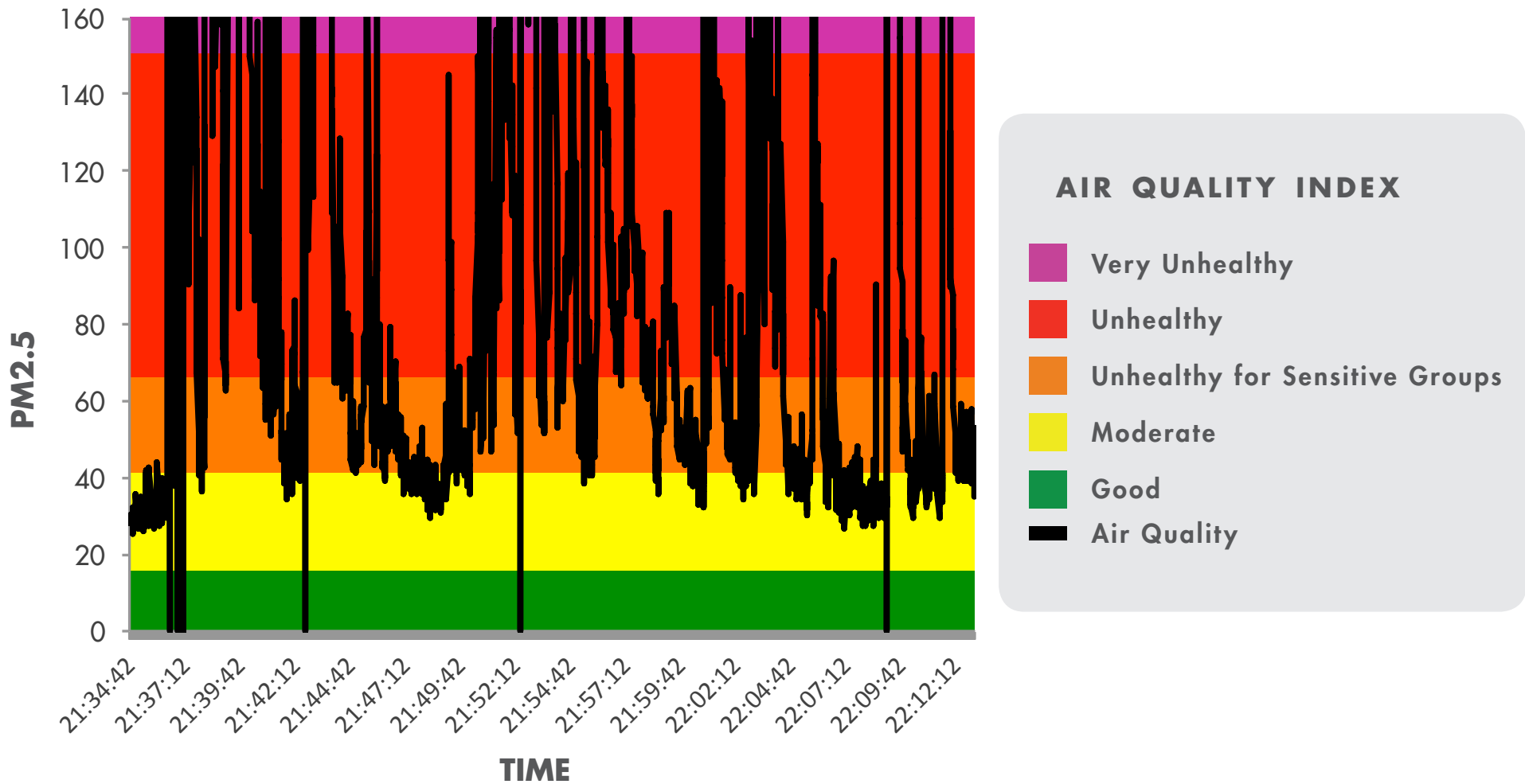


Smoking: PM2.5 = 126.0 $\mu\text{g}/\text{m}^3$
 This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*.
 → venue 15

Non-Smoking: PM2.5 = 51.9 $\mu\text{g}/\text{m}^3$
 This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy for Sensitive Groups Air Quality*.
 → venue 15

SMOKING ALLOWED

CLEVELAND RESTAURANT



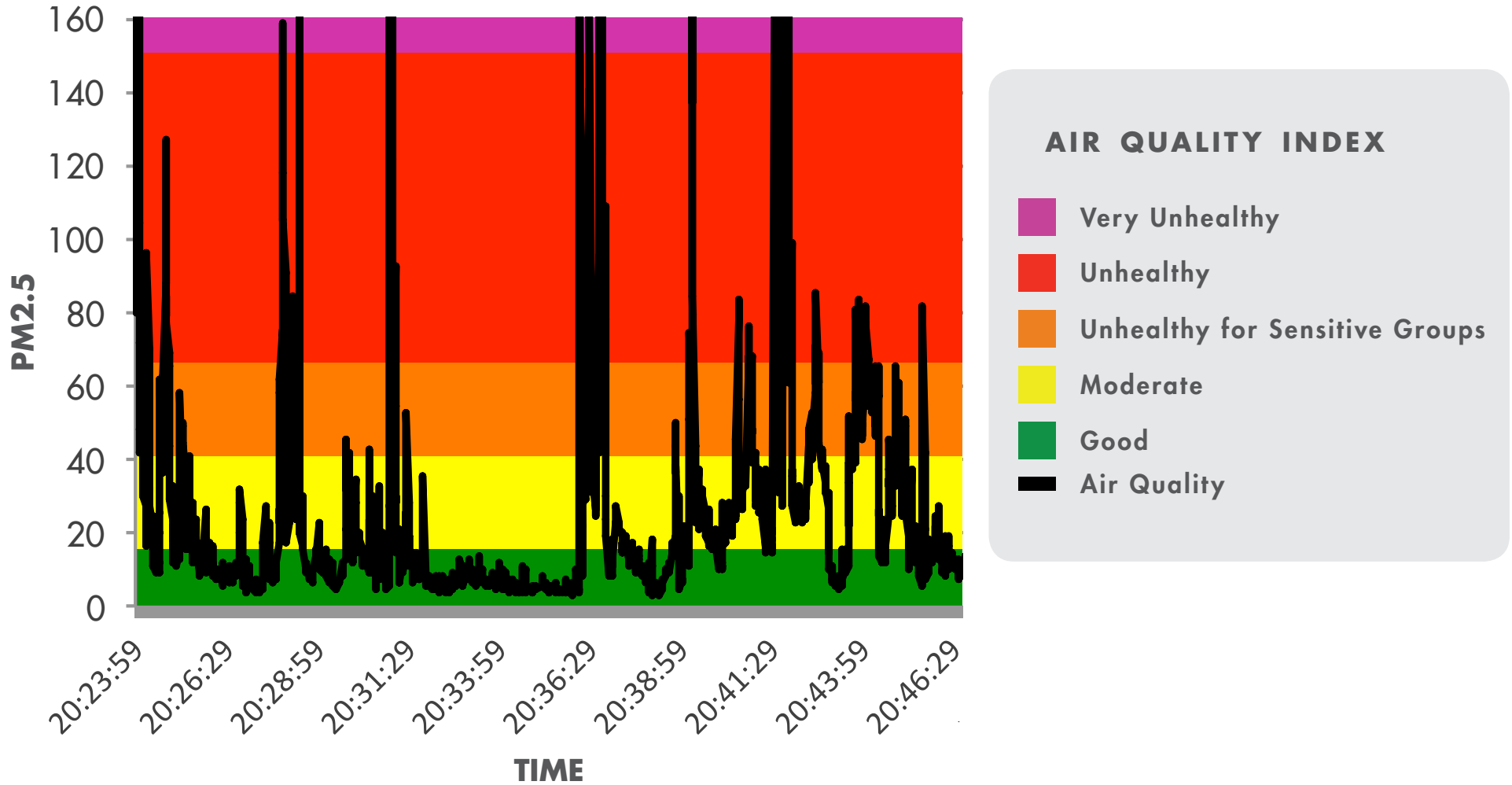
PM2.5 = 127.0 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*.

→ venue 21

SMOKING ALLOWED

CLEVELAND RESTAURANT

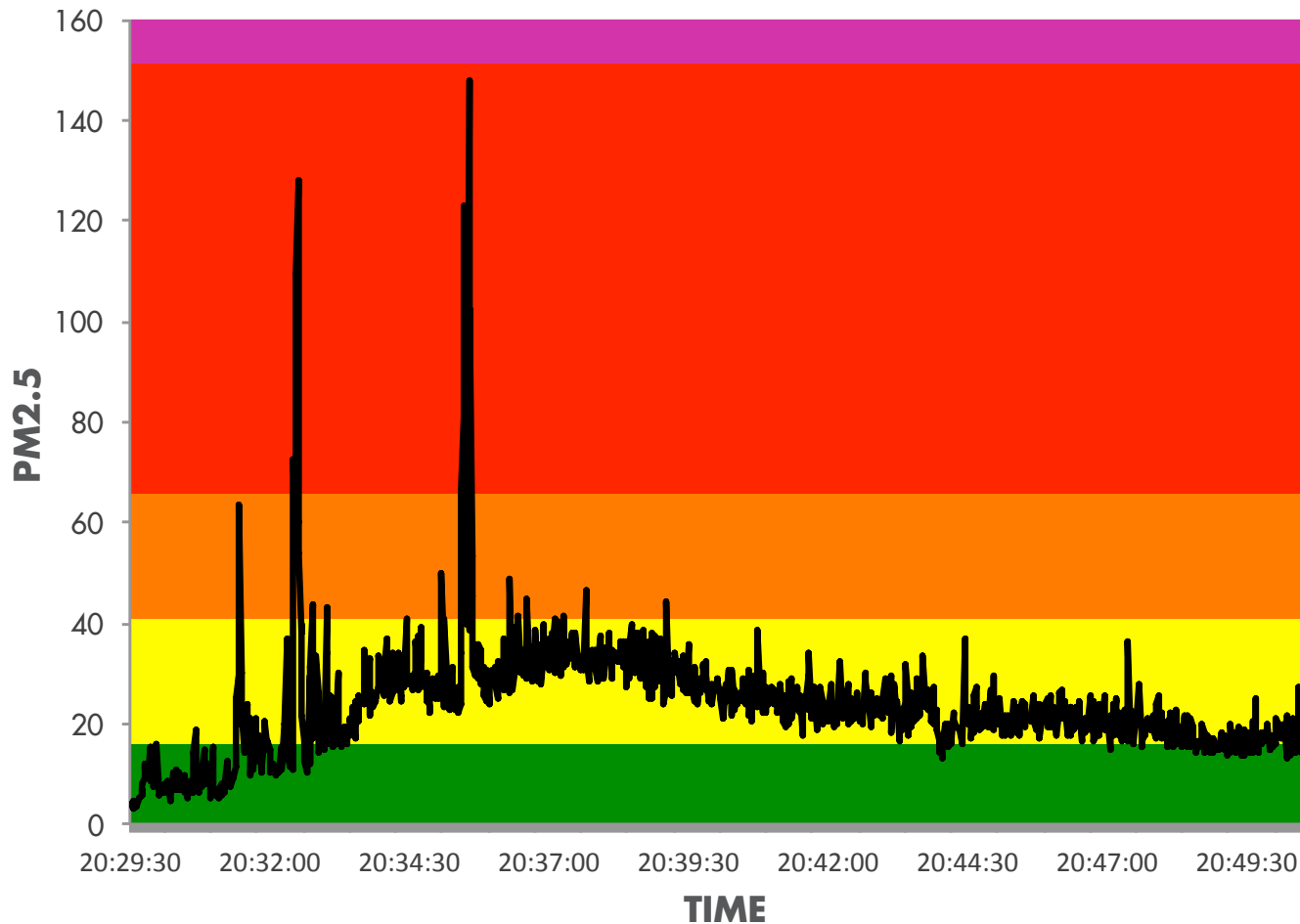


PM2.5 = 25.0 µg/m³

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Moderate Air Quality*.

→ venue 20

SMOKING ALLOWED | GULFPORT RESTAURANT



AIR QUALITY INDEX

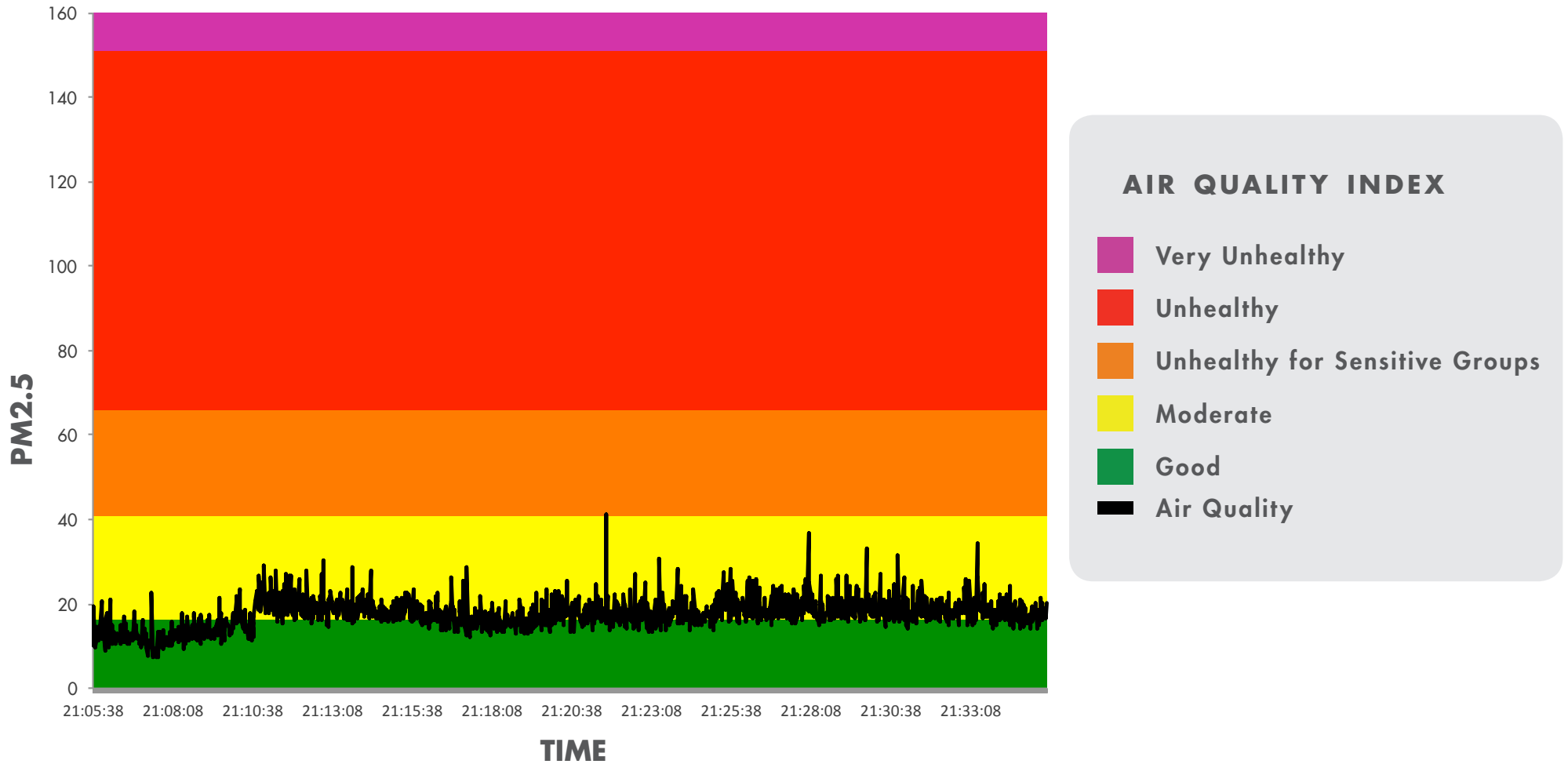
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 21.7 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Moderate Air Quality*.

→ venue 18

SMOKING ALLOWED | GULFPORT RESTAURANT

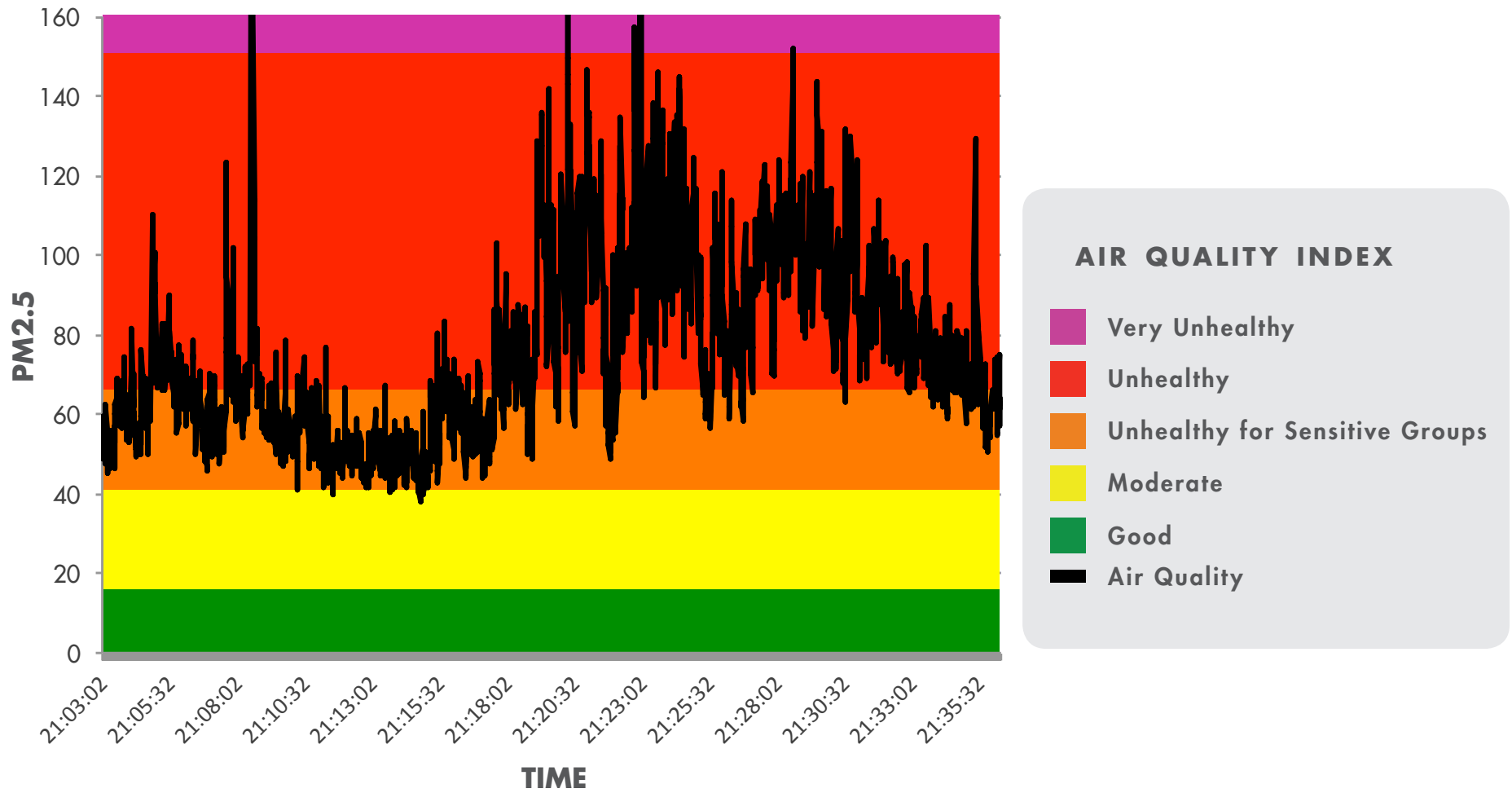


PM2.5 = 17.1 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Moderate Air Quality*.

→ venue 19

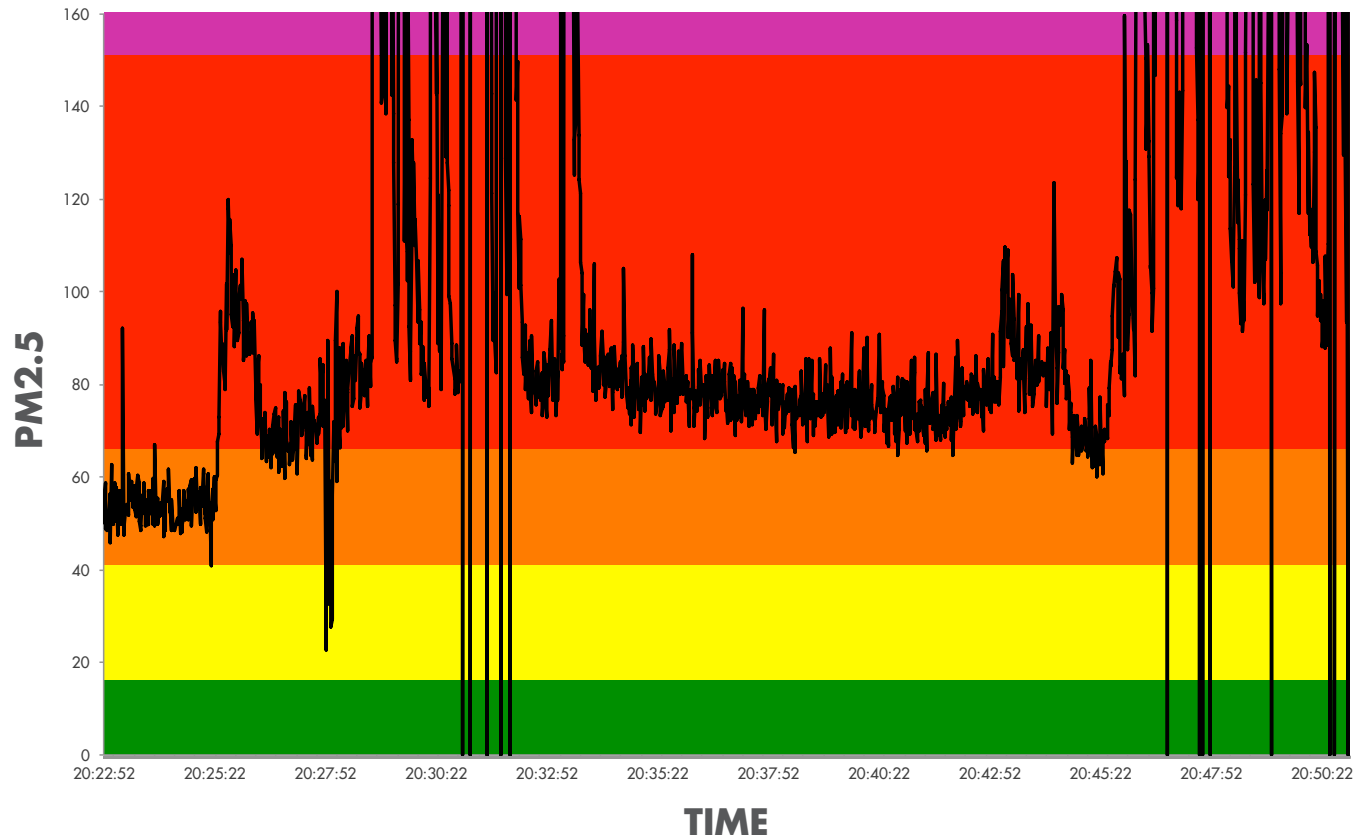
SMOKING ALLOWED | McCOMB RESTAURANT



PM2.5 = 75.4 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*. → venue 17

SMOKING ALLOWED | McCOMB RESTAURANT



AIR QUALITY INDEX

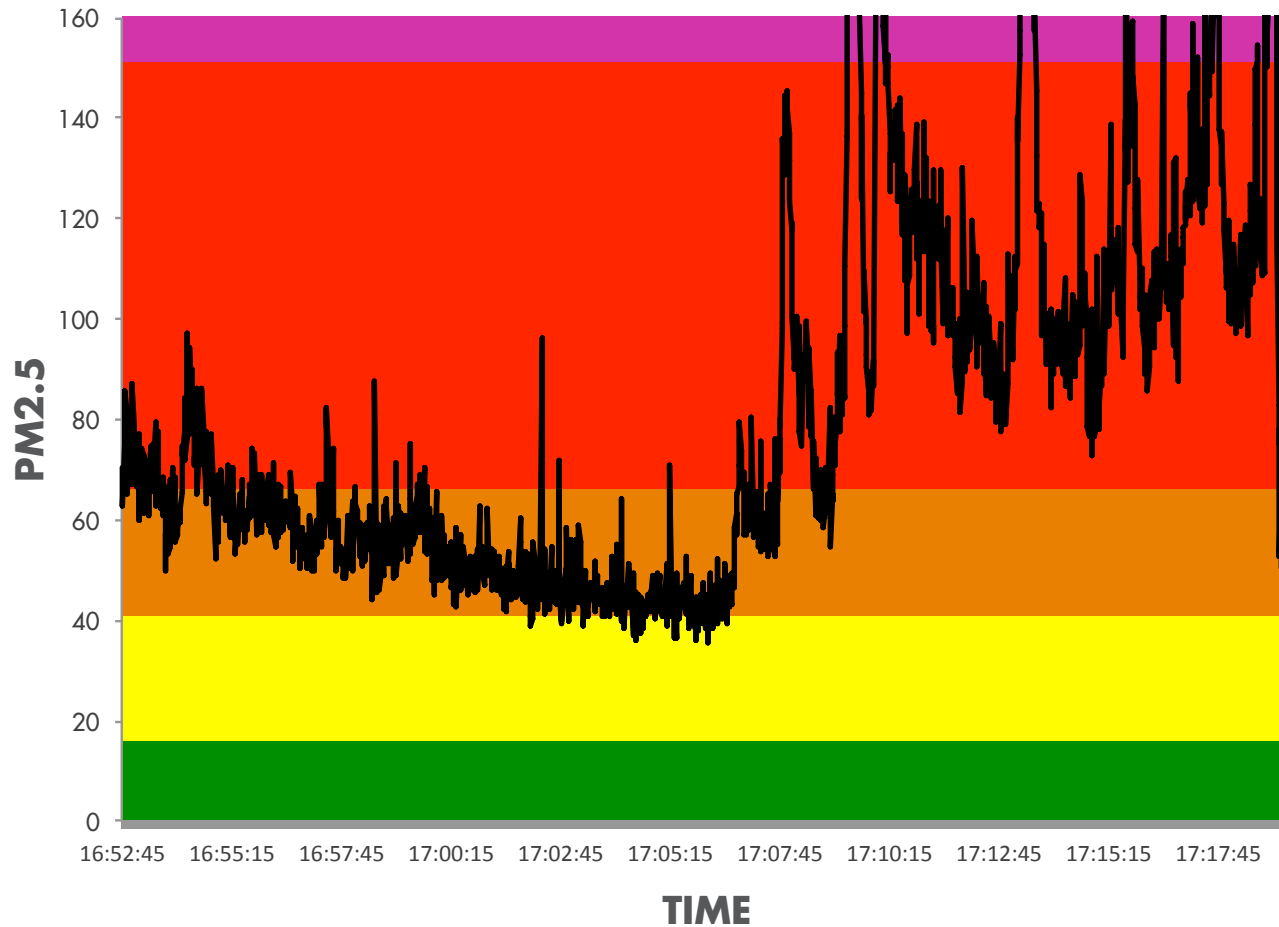
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 157.2 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Very Unhealthy Air Quality*.

→ venue 16

SMOKING ALLOWED | OLIVE BRANCH BAR



AIR QUALITY INDEX

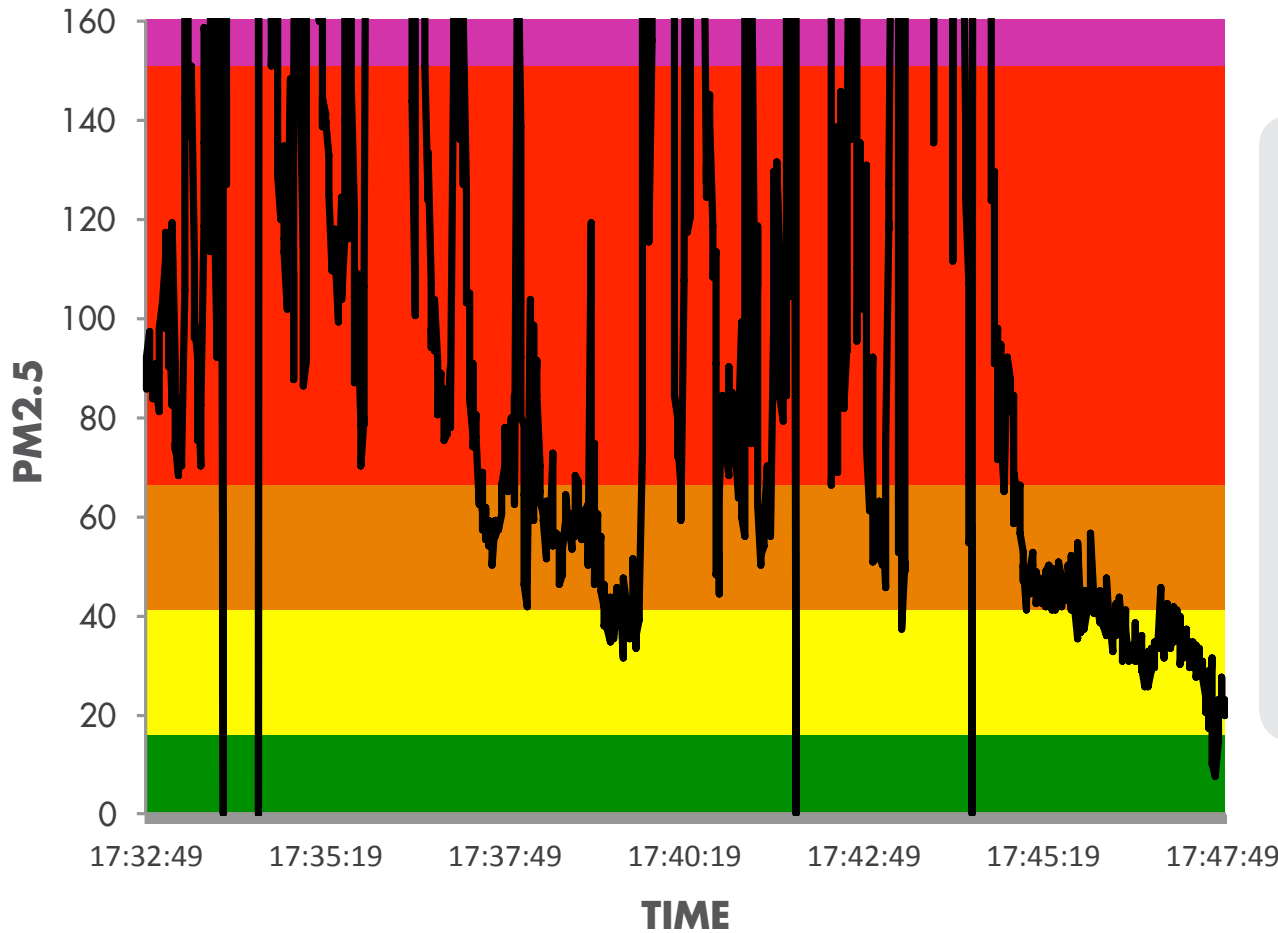
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 96.2 µg/m³

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*. → venue 24

SMOKING ALLOWED

OLIVE BRANCH BAR



AIR QUALITY INDEX

- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

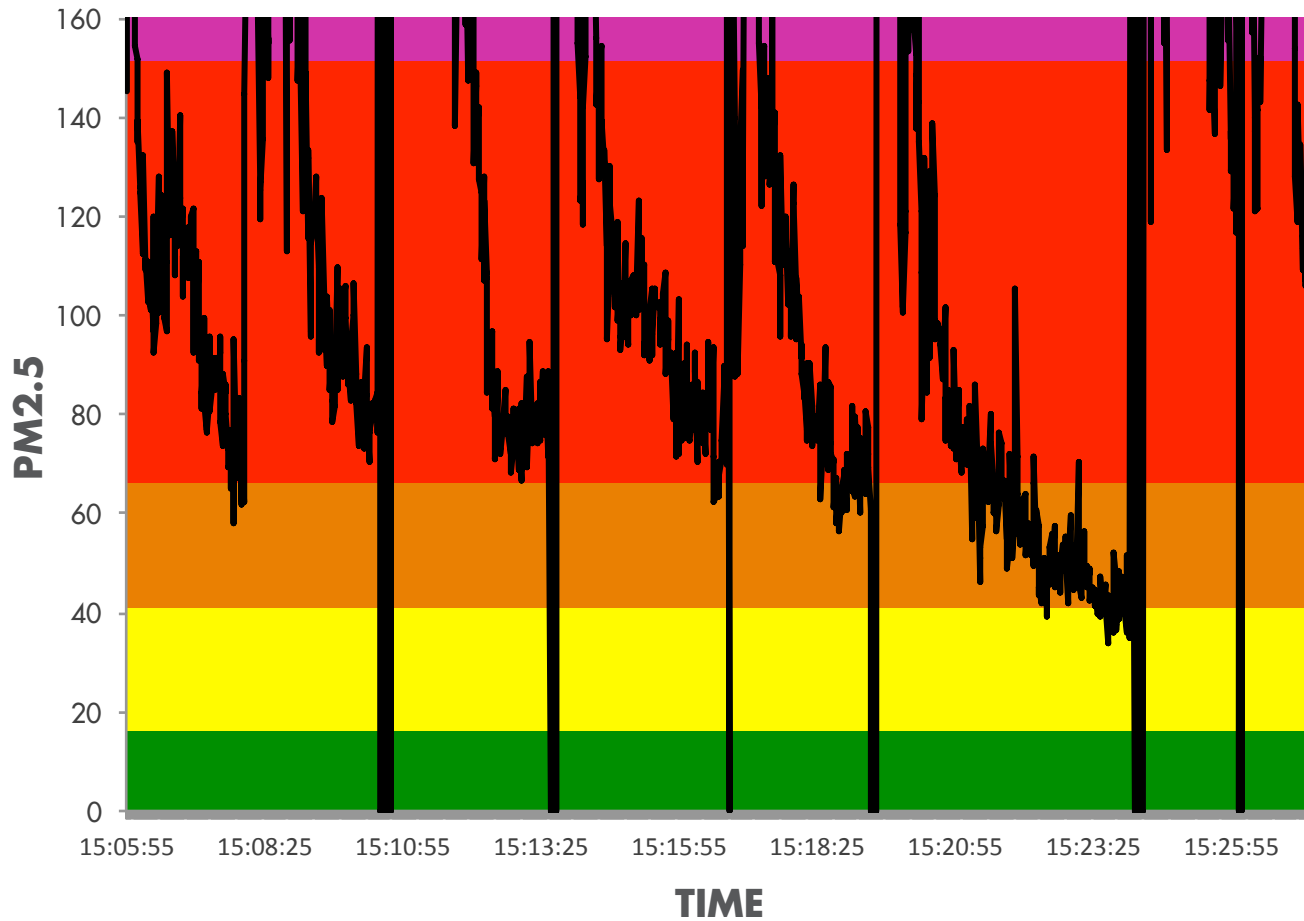
PM2.5 = 166.3 µg/m3

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Very Unhealthy Air Quality*.

→ venue 26

SMOKING ALLOWED

OLIVE BRANCH BAR



AIR QUALITY INDEX

- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

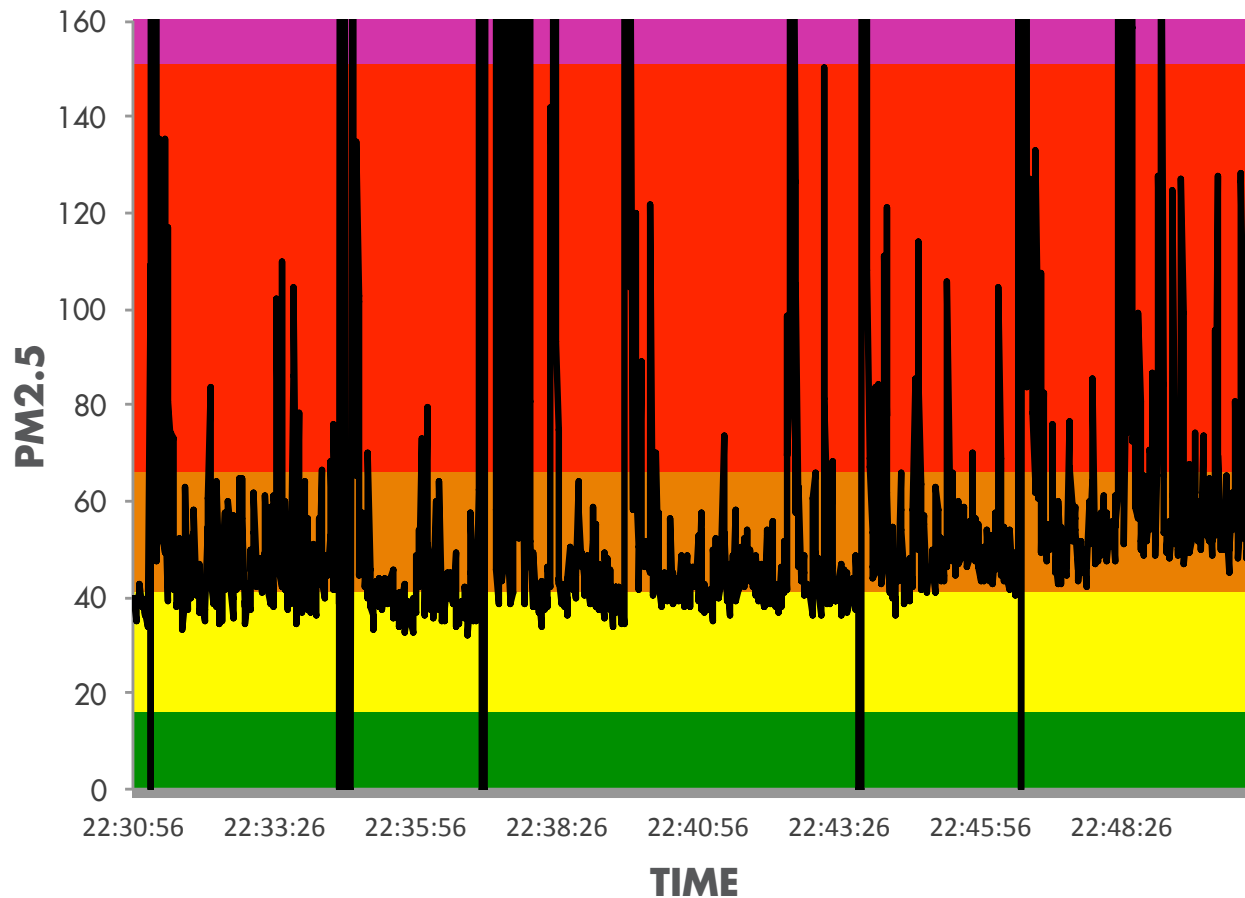
PM2.5 = 173.5 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Very Unhealthy Air Quality*.

→ venue 25

SMOKING ALLOWED

WEST POINT RESTAURANT



AIR QUALITY INDEX

- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

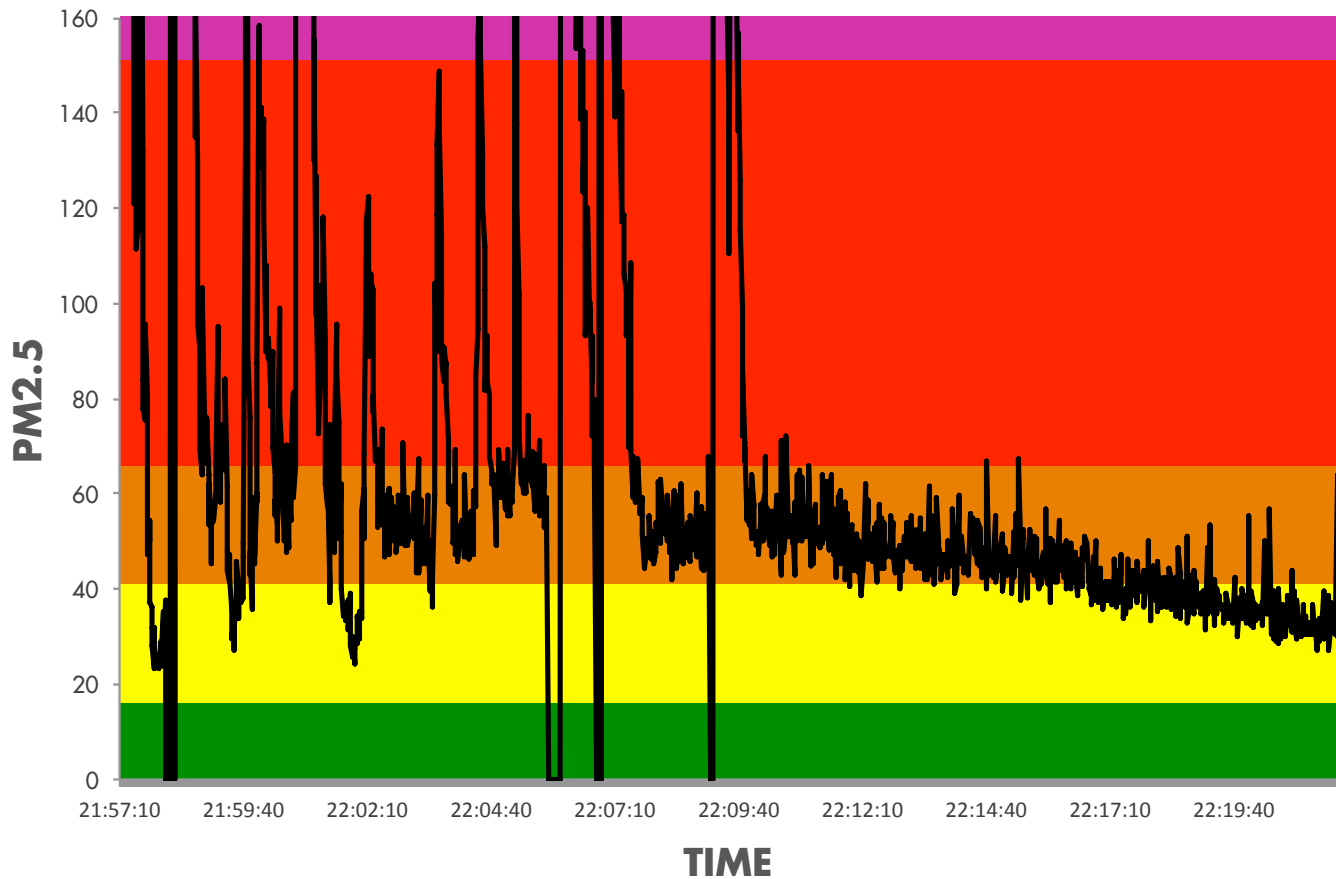
PM2.5 = 75.5 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*.

→ venue 23

SMOKING ALLOWED

WEST POINT RESTAURANT



AIR QUALITY INDEX

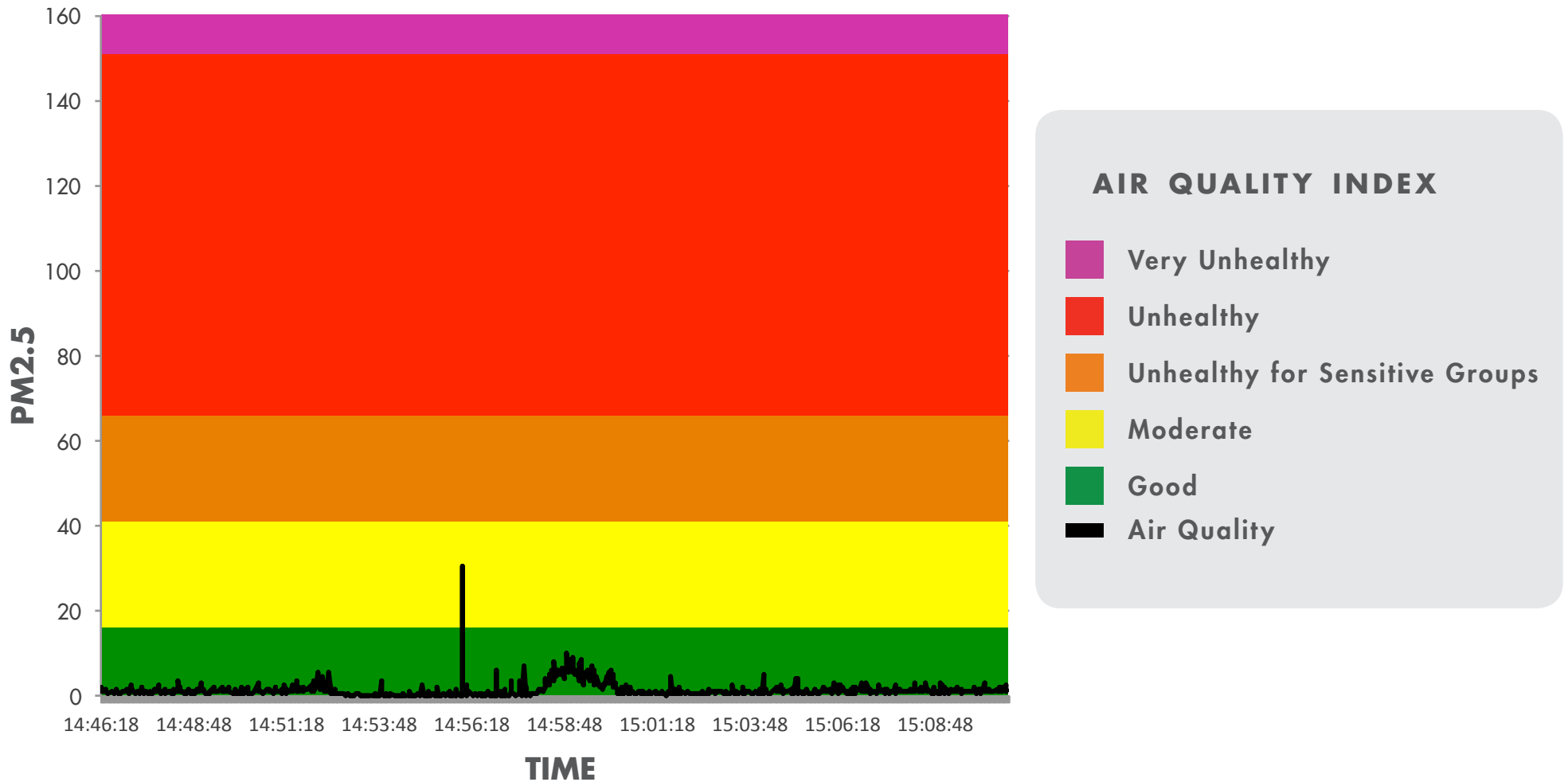
- Very Unhealthy
- Unhealthy
- Unhealthy for Sensitive Groups
- Moderate
- Good
- Air Quality

PM2.5 = 116.0 µg/m³

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*.

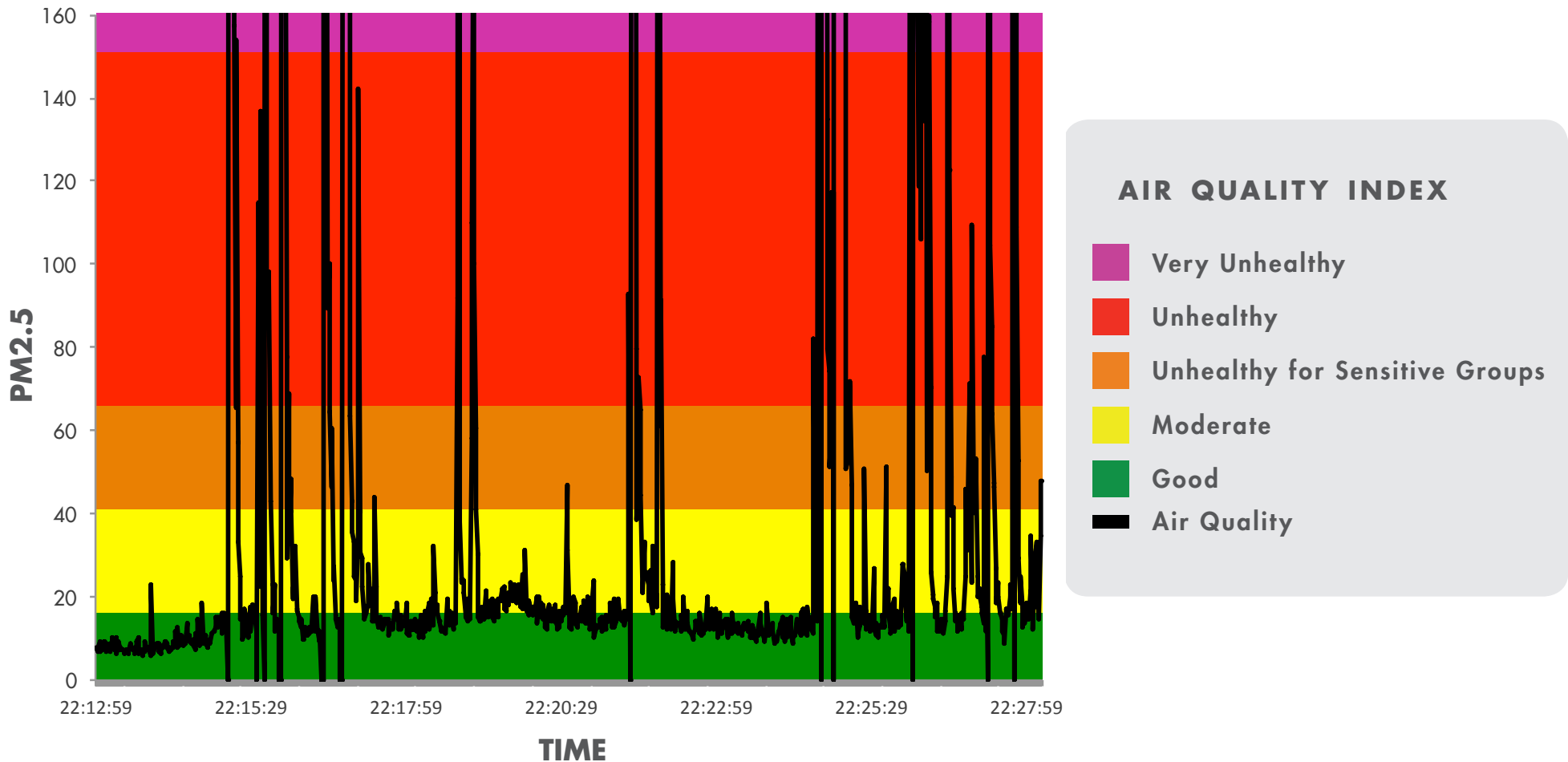
→ venue 22

SMOKE-FREE | BILOXI CASINO



PM2.5 = 1.3 $\mu\text{g}/\text{m}^3$
This PM2.5 level is within the current U.S. Environmental Protection Agency's threshold for *Good Air Quality*.
→ venue 30

SMOKING ALLOWED | BILOXI CASINO

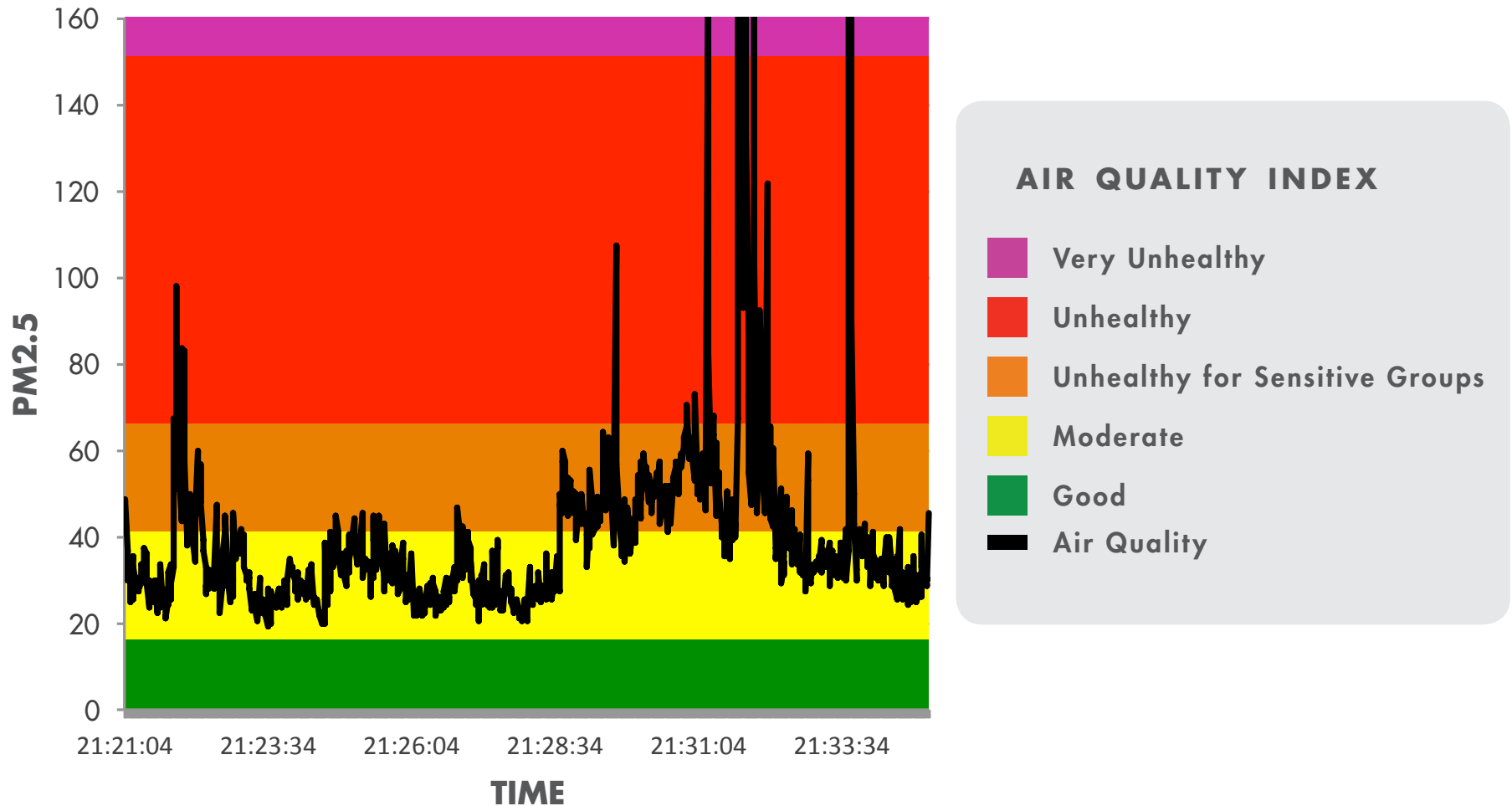


PM2.5 = 57.9 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy for Sensitive Groups* Air Quality.

→ venue 29

SMOKING ALLOWED | BILOXI CASINO

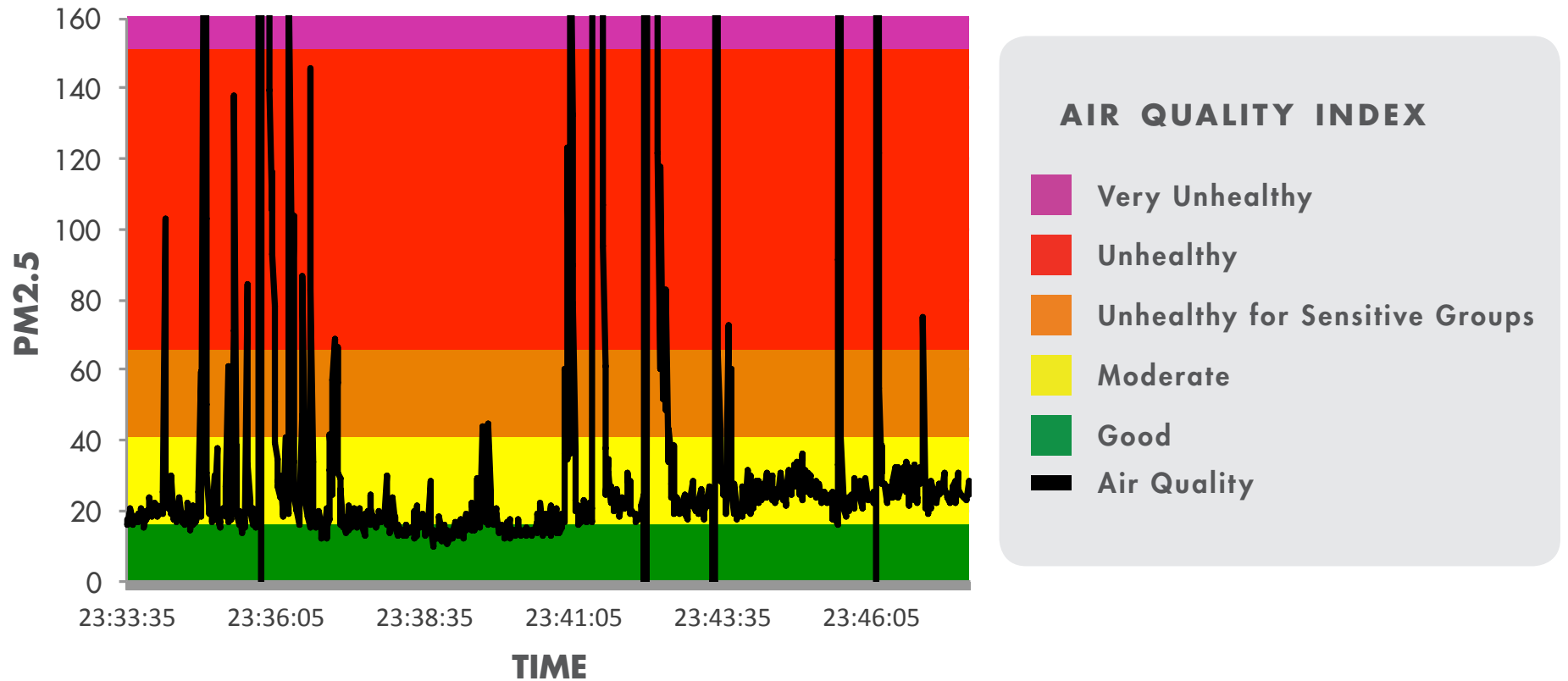


PM2.5 = 44.9 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy for Sensitive Groups* Air Quality.

→ venue 28

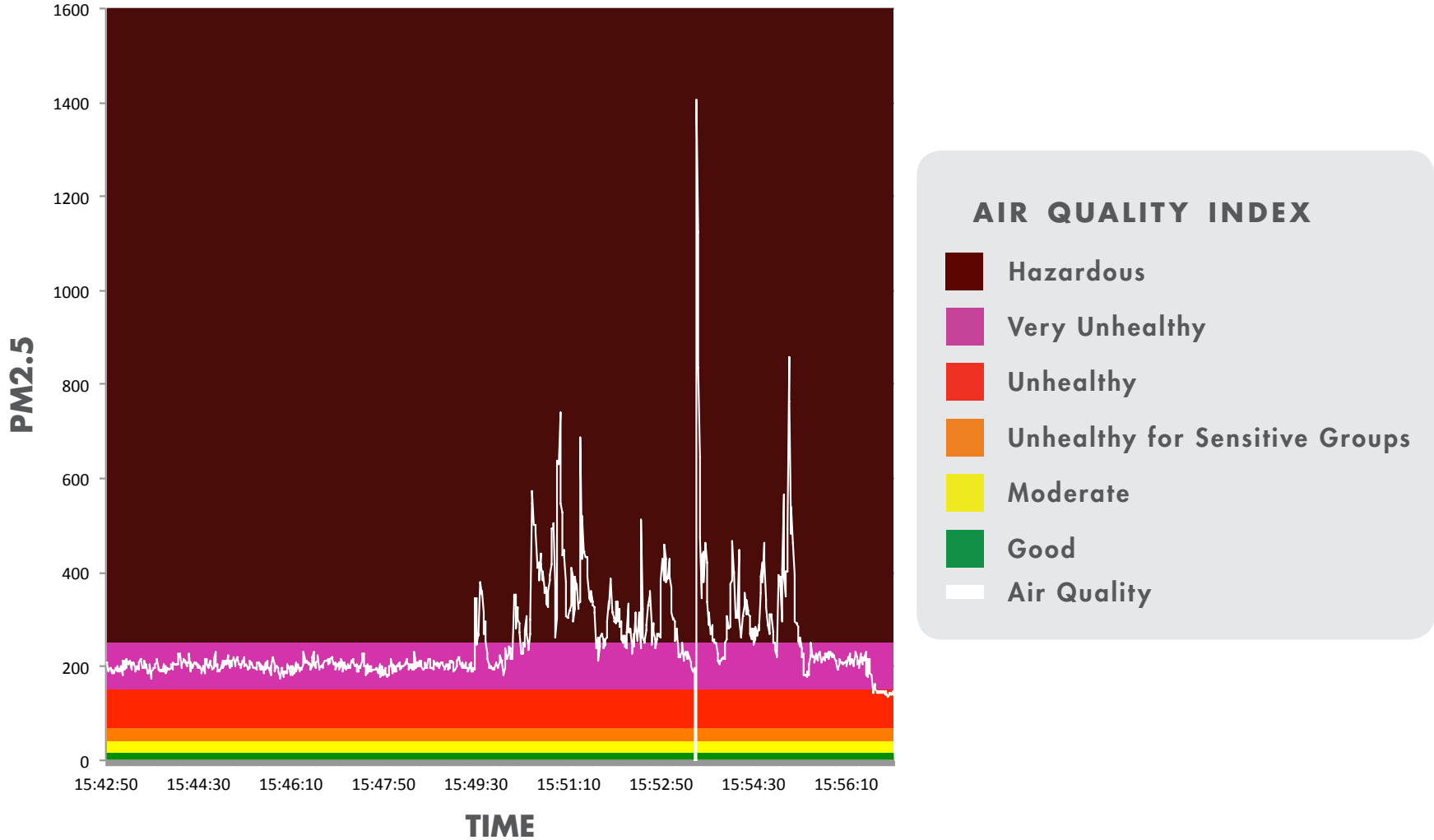
SMOKING ALLOWED | BILOXI CASINO



PM2.5 = 48.4 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy for Sensitive Groups* Air Quality.

→ venue 27

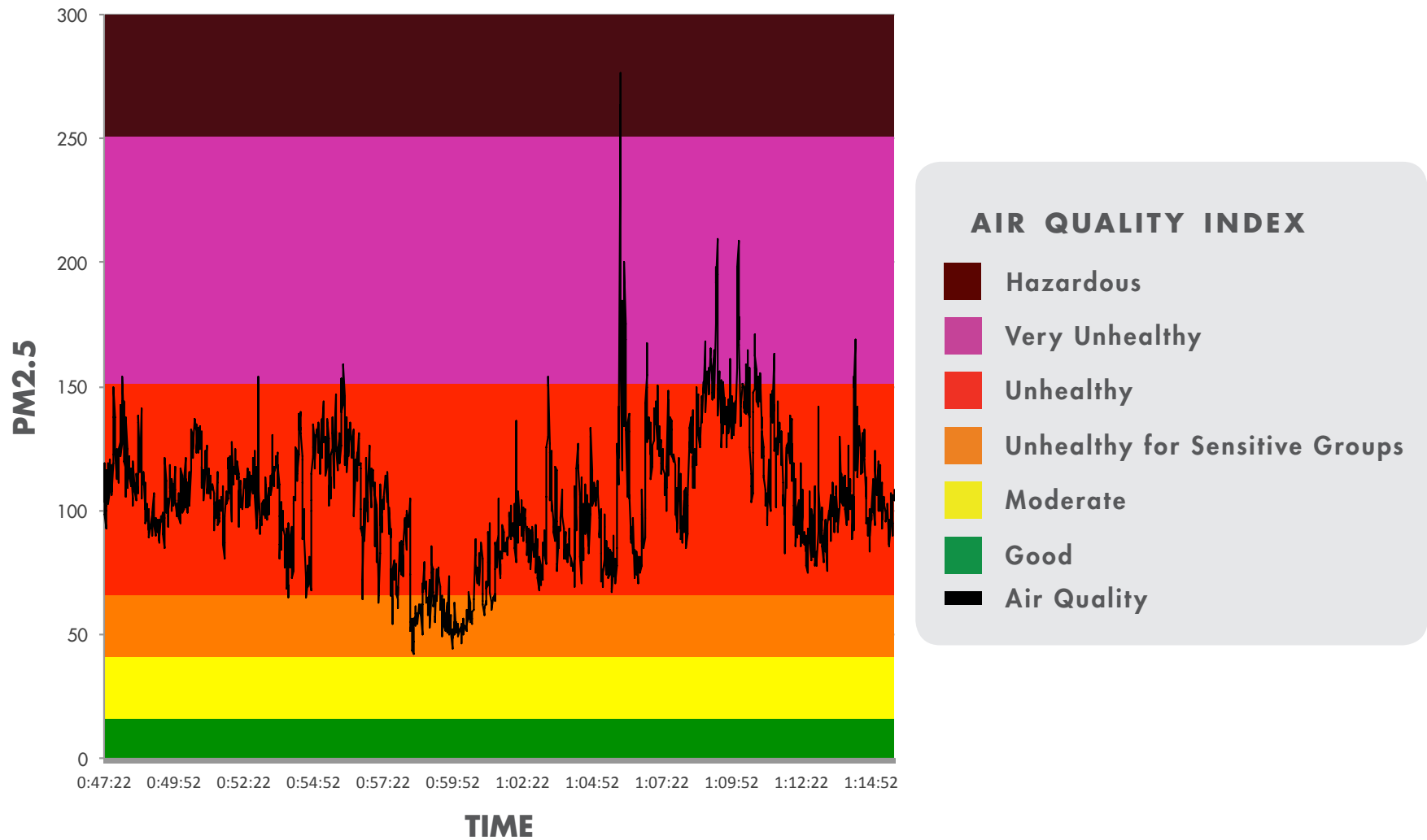


PM2.5 = 245.3 µg/m³

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Very Unhealthy Air Quality*.

→ venue 31

AFTER 9 PM, SMOKING ALLOWED | OLIVE BRANCH POOL HALL



PM2.5 = 104.2 $\mu\text{g}/\text{m}^3$

This PM2.5 level exceeds the current U.S. Environmental Protection Agency's threshold for *Unhealthy Air Quality*. → venue 31

CONTACT INFORMATION

Robert McMillen, Ph.D.
Social Science Research Center
Mississippi State University

ROBERT.MCMILLEN@SSRC.MSSTATE.EDU

WWW.SSRC.MSSTATE.EDU

WWW.MSSTATE.EDU

One Research Blvd., Suite 103
Starkville, MS 39759

P: 662.325.7127

F: 662.325.7966

For more information visit

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