



STATE OF MICHIGAN

DEPARTMENT OF HEALTH AND HUMAN SERVICES
LANSING

GRETCHEN WHITMER
GOVERNOR

ELIZABETH HERTEL
DIRECTOR

August 8, 2025

Chris Westover
Environmental Health Director
Monroe County Health Department
2353 S Custer Road
Monroe, MI 48161

Dear Mr. Westover,

As previously discussed, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) made the Michigan Department of Health and Human Services (MDHHS) aware of outdoor air odor complaints made by local residents that reside in Dundee Township. The odor complaints stemmed from large-scale use of groundwater from an aquifer known to be contaminated with naturally occurring hydrogen sulfide (H_2S , see Figure 1). In accordance with MCL 333.2221, MDHHS collected and evaluated ambient air data from the community and discovered repeated occurrences of H_2S in the breathing zone level. MDHHS concludes that measured ambient air concentrations of H_2S in the Dundee Township investigation area can reach levels that are a public health hazard.

Background

The investigation area is a 2.5 square mile area located within Dundee Township in Monroe County and is largely agricultural. In 2017, residents began submitting odor complaints to EGLE related to elevated levels of H_2S in ambient air. In response to these odor complaints, EGLE conducted a source investigation using continuous ambient air monitoring during the growing seasons of 2019, 2020, and 2021. EGLE data demonstrated that large-scale groundwater use by pivot irrigation systems in this area resulted in high concentrations of total reduced sulfur compounds in ambient air at the agricultural fields (EGLE Briefing Paper: *Elevated Ambient Air Hydrogen Sulfide (H_2S) Levels Detected Adjacent to Residential Homes Near Dundee in Monroe County*, December 9, 2021). MDHHS then conducted targeted ambient air monitoring and sampling to provide H_2S data that represent breathing in the ambient air at nearby residences.

Ambient Air Exposure Data

Collection

In 2022 and 2023, MDHHS performed air monitoring and sampling at the site. In 2022, MDHHS collected 24-hour ambient air canister samples from three residences on August 20 and September 13. In 2023, MDHHS collected 24-hour ambient air canister samples from three residences on July 22 and September 22 and conducted ambient air monitoring at the same three residences June 5 through August 25 (Table 1). MDHHS compared sampling and monitoring data to the Agency for Toxic Substances and Disease Registry (ATSDR) acute Minimal Risk Level (MRL) of 70 parts per billion (ppb) to evaluate the potential for transient health effects from short-term exposure.

Evaluation

Of the four, 24-hour air canister sampling events MDHHS conducted in 2022 and 2023, H₂S was only detected during the July 22, 2023, sampling (Table 2). Air samples from two of the three residences sampled on that date were approximately three times higher than the acute MRL of 70 ppb.

The air monitoring data MDHHS collected June 5, through August 25, 2023, shows that during the acute time periods identified in Table 3, H₂S concentrations exceeded the acute MRL of 70 ppb with H₂S ambient air concentrations reaching 1,000s of ppb (Table 3; Figure 2). Over this monitoring timeframe, maximum 30-minute average H₂S concentrations were over 104 times higher and maximum 24-hour averages were more than five times higher than the acute MRL. At the three air monitoring locations, 30-minute average H₂S concentrations exceeded the acute MRL during 86, 98 and 104 individual 30-minute periods. Depending on location, these 30-minute exceedance periods occurred on 19 separate calendar days at two locations, and 24 separate calendar days at the third. Further, H₂S was detected above 1,000 ppb by at least one of the three monitors on eight separate days. During one event, H₂S concentrations at Residence D exceeded the 10,000-ppb maximum detection limit of the air monitor. These maximum detections occurred during 20 individual minutes (15%) of a 131-minute period between 10:58 p.m. on July 21 and 1:09 a.m. on July 22, 2023.

Conclusions

MDHHS concludes that measured ambient air concentrations of H₂S at the Dundee Township investigation area can reach levels that are a public health hazard. Breathing in maximum measured levels of H₂S over acute time periods could cause impaired respiratory function. Impaired respiratory function is expected to resolve after exposure has ended but could occur repeatedly in exposed community members throughout the growing season. People with asthma or other respiratory conditions would be at greatest risk, but even individuals without preexisting conditions may experience respiratory effects, headaches, or other odor-related effects such as nausea.

Recommendations

MDHHS recommends that:

- Large-scale groundwater use activities within the Dundee Township investigation area be modified as needed to prevent offsite migration of hazardous H₂S levels so that ambient air concentrations in the community do not exceed acute public health screening levels.
- Residents in the area be notified about these findings and provided educational information about H₂S, and guidance on how to report odor complaints.
- Public health technical assistance be provided to partner agencies and large-scale groundwater users within the Dundee Township investigation area for developing a plan to ensure H₂S emissions from large-scale groundwater use do not exceed acute public health screening levels in the community.
- After corrective actions are taken, confirmation ambient air monitoring and/or sampling be performed to verify that the corrective actions have reduced, and can subsequently maintain, residential H₂S concentrations below acute public health screening levels.
- Residents consult their health care provider if experiencing any adverse health effects from exposure to H₂S. Community members can reduce their exposure to H₂S by limiting their time outdoors to the extent possible when H₂S odors are present. MDHHS understands that it is not always possible to avoid exposure to ambient air contamination and that reduction in H₂S exposure levels will ultimately require that H₂S be controlled at the source.

Public Health Action Plan

MDHHS, working with the Monroe County Health Department, will pursue the following public health actions:

- Continue to provide technical support and assist with any public health action as needed.
- Remain available to evaluate air or health data that is collected or to collect additional data if needed.
- Work with local large-scale groundwater users to identify voluntary actions to eliminate hazardous H₂S ambient air concentrations in the residential community.
- Work with the regulatory agencies of the Michigan Department of Agriculture and Rural Development and EGLE to explore regulatory actions to protect people from hazardous H₂S ambient air concentrations in the residential community.
- Take action under the public health code to notify people in this area about measured hazardous H₂S ambient air concentrations in the residential community.

These conclusions and recommendations are as of the date on this letter. MDHHS may produce additional public health documents with new or updated public health determinations as new or additional information is received. If you have any questions or concerns, please contact the MDHHS Environmental Health Bureau at 800-648-6942. You can also contact an MDHHS toxicologist directly at carrickj@michigan.gov.

Sincerely,



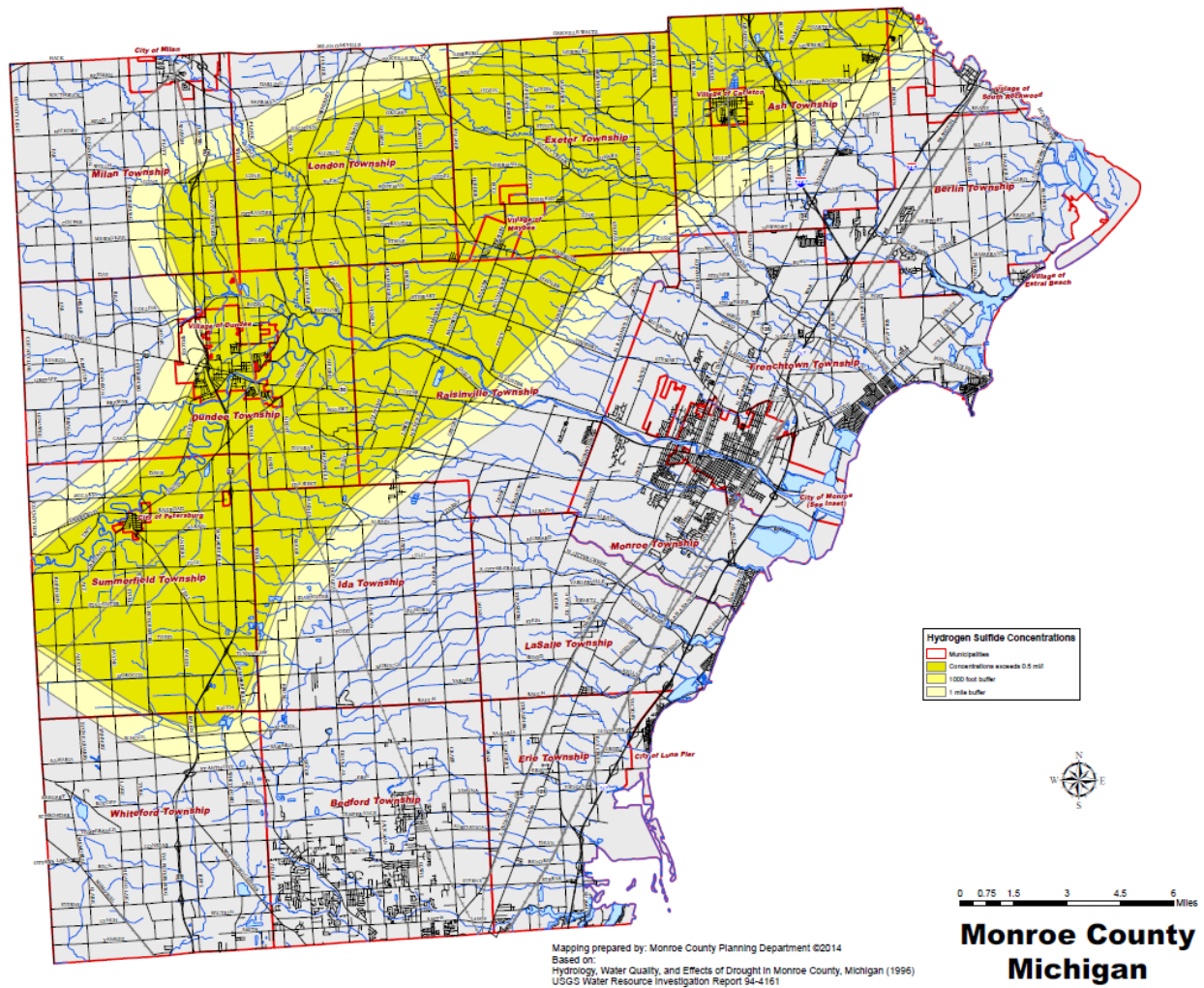
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Figure 1. Map of aquifer known to contain naturally occurring hydrogen sulfide at levels above the detection limit of 0.5 milligrams per liter, Monroe County, Michigan.



Footnote: This map represents the general area in Monroe County where H₂S has been measured above detectable levels on the groundwater aquifer. The boundary presented in this map is approximate and should not be used to make definitive conclusions to where the H₂S contamination begins or ends.

Figure 2. Air monitoring data showing one-minute average H₂S concentrations in parts per billion (ppb) at the three Dundee Township air monitoring locations between June 5, and August 25, 2023. Note the different H₂S concentration scales in each graph.

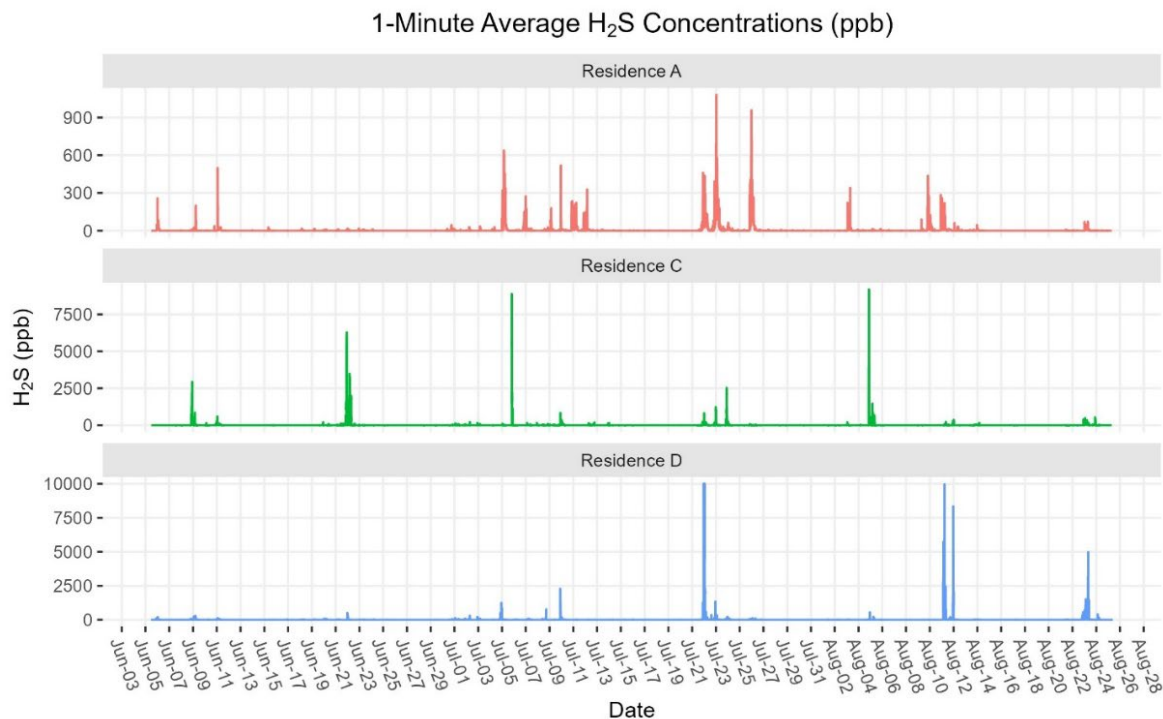


Table 1. Summary of MDHHS air monitoring and sampling at the Dundee Township site.

Date	Agency	Method	Analyte	Locations
Aug. 20 and Sept. 13, 2022	MDHHS	Air Canister Samples	H ₂ S	Residence A Residence B Residence C
July 22 and Sept. 22, 2023	MDHHS	Air Canister Samples	H ₂ S	Residence A Residence C Residence D
June 5 – Aug. 25, 2023	MDHHS	SPM Flex Monitor	H ₂ S	Residence A Residence C Residence D

Table 2. Results of MDHHS 24-hour air canister sampling at the Dundee Township site.

	Aug 20, 2022	Sept 13, 2022	July 22, 2023	Sept 22, 2023
	H ₂ S (ppb)	H ₂ S (ppb)	H ₂ S (ppb)	H ₂ S (ppb)
Residence A	<7.8	<7.2	39	<8.7
Residence B	<9.1	<8.7	NS	NS
Residence C	<9.7	<9.6	190	NA
Residence D	NS	NS	210	<9.7
Acute MRL	70	70	70	70

< = H₂S was not detected above the reporting limit shown

NS = Not sampled

NA = Sample not analyzed due to equipment failure

ppb = Parts per billion

Bold font = Concentration exceeds acute MRL

Table 3. Maximum H₂S concentrations detected at each MDHHS air monitoring location.

Location	Averaging Time	Maximum Average H ₂ S (ppb)
Residence A	1 minute	1,081
	30 minute	523
	24 hour	75
	2 week	16
Residence C	1 minute	9,197
	30 minute	2,936
	24 hour	175
	2 week	25
Residence D	1 minute	>10,000
	30 minute	>7,298
	24 hour	>367
	2 week	>46
Acute MRL		70

ppb = Parts per billion

Bold font = Concentration exceeds acute MRL

> = H₂S detections during this period exceeded the 10,000-ppb maximum detection limit of the air monitor