

# Community Member Assessment of Environmental Odors

Do you smell bad environmental odors in your community? How often? Every day or just once in a while? Do they annoy you or make you feel sick? How can you know how much environmental odor is too much and when an odor becomes a health hazard?

Everyone reacts to environmental odors differently. Some people are more sensitive to environmental odors than others. When you are more sensitive to an odor, you may have symptoms even at a low level of the odor in air. In general, as concentration levels increase, more people will have symptoms.

If an environmental odor is affecting your daily life, you can get help. Your local health department or code enforcement agency<sup>1</sup> can investigate odors and decide whether they are harmful. You can help them by keeping an odor diary.

## Odor Diary Questions & Answers (Q/A)

### Q. What is an odor diary?

A. An odor diary is a daily record of the environmental odors you smell in your neighborhood.

### Q. Why do I need to keep an odor diary?

A. Your odor diary can help health officials and code enforcement officials know **where** and **when** the odor is worse, so they can take action to handle the odor problem quickly.

### Q. How long should I keep an odor diary?

A. Sometimes odor diaries can provide useful information in as little as two weeks if the odor occurs daily or several times a day. But if the odor only occurs once a week, you will need to keep the odor diary long enough to record several different times when you smell the odor. Contact your local health department/code enforcement agency as you begin your odor diary if you have questions about how long you should record the odor or other details.

### Q. What information is in an odor diary?

A. In an odor diary you will answer questions like, "What type of odor did you smell?" or "Did you stay indoors because of the bad smell?" Every day you will record information about the odor's **frequency**, **intensity**, **duration**, and **offensiveness** (FIDO characteristics). (See [ATSDR Odor Diaries](#))

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<sup>1</sup> Organizations that ensure compliance with laws and rules such as a health inspector or zoning enforcement officer.

## In general, environmental odors can affect your quality of life if you answer “yes” to any of these questions.

1. Does it interfere with your normal activities?
2. Does it make you feel sick?
3. Do you smell it
  - a. Every day?
  - b. Every week for more than one hour?
  - c. Every month for a few hours?

If you answered “yes” to any of these questions, begin keeping an odor diary. Every day, record information about the odor’s frequency, intensity, duration, and offensiveness (FIDO characteristics). (See [ATSDR Odor Diaries](#))

When you have completed your environmental odor diary, contact your local health department/code enforcement agency and offer it to the proper staff member..

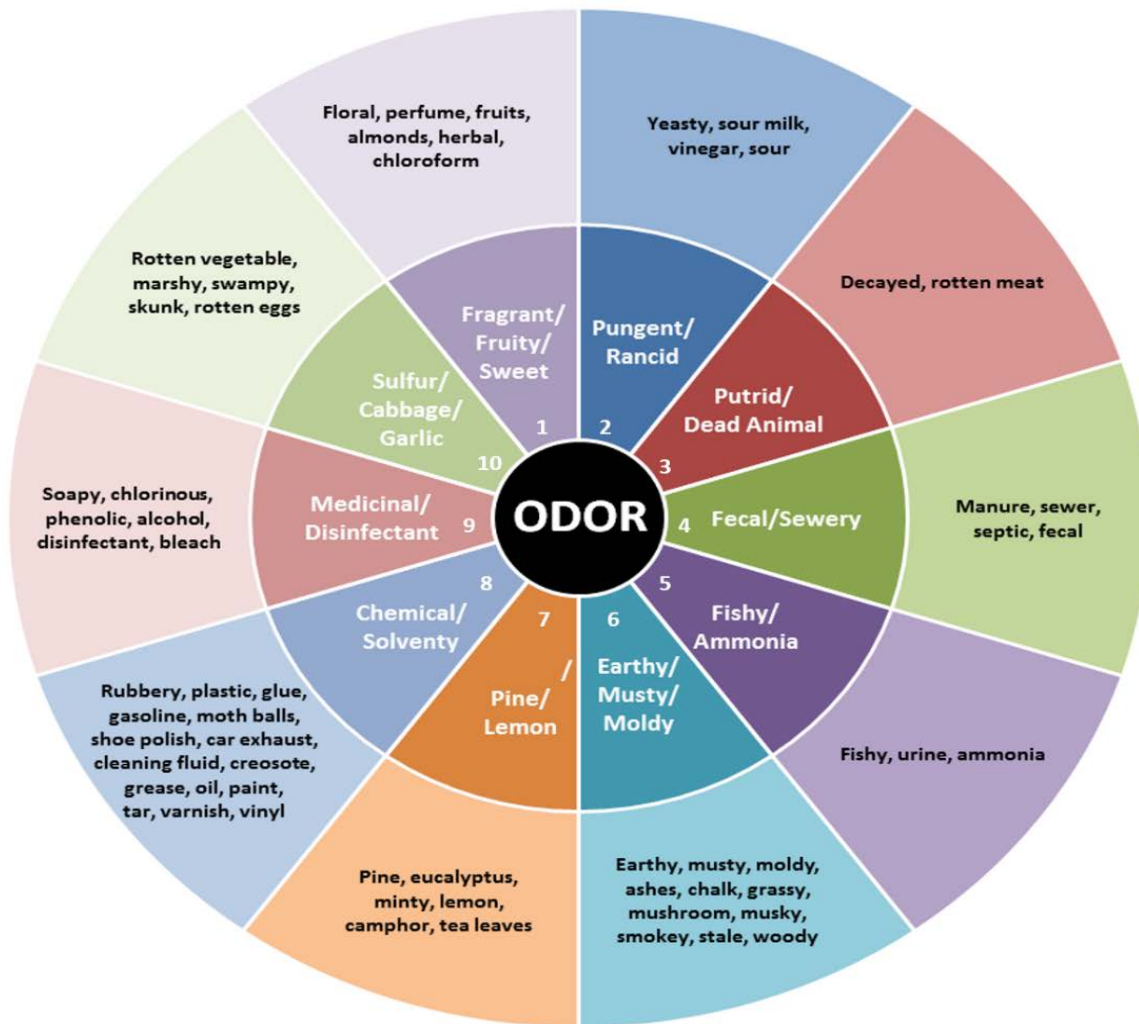
For more information on environmental odors, go to [ATSDR’s Environmental Odor website](#).

The best way to capture information on your environmental odor’s FIDO characteristics (frequency, intensity, duration, and offensiveness) is to follow these steps. Begin in reverse order with offensiveness first.

Note: For better results, make your assessment during the odor event or immediately after. Also, using the FIDO process may show that your environmental odor does not reach the level of a nuisance odor.

# FIDO Steps (frequency, intensity, duration, and offensiveness)

1. How offensive is the environmental odor?
  - a. Find more specific odors in the outer circle below.
  - b. Find the general type of odor in the inner circle.
  - c. Find the environmental odor or type of odor in the lists below to determine how offensive the odor is.



### Not Unpleasant

1. Floral and herbal smells
7. Pine and minty smells

Alcohols

Fresh-cut grass or hay

Normal coffee roasting

Normal food preparation

Bakery

Perfume

Spice packaging

Winery

### Unpleasant

5. Fishy smells
6. Earthy, musty, musky, stale smells
8. Chemical smells
9. Medicinal and soapy smells

Sewage during treatment

Cattle operation under best management practices

Water-based painting

Gasoline, diesel fuel

Diesel exhaust

Asphalt odors

Burned coffee/food

Burning brush or wood

Ammonia

Chlorine

Tobacco smoke

Marijuana smoke

Dry cleaner odors

Constant BBQ odors

Local industry or manufacturing (specify)

Natural gas drilling/fracking

Asphalt plants

### Offensive

2. Pungent and rancid smells
4. Fecal smells

Landfill garbage/waste

Cattle lagoon cleanout

Confined hog operations

Confined poultry operations

Decaying compost

Unprocessed material and wastewater from dead animal recycling plants

Typical grease trap odor

Waste burning [rubber, plastic, tires, other non-wood materials]

Failing or improperly operated septic systems

Organic products like auto body paint & styrene

### Highly Offensive

3. Putrid smells
10. Rotten and marshy smells

Untreated or barely treated sewage

Decaying animals/fish

Animal hide processing

Rotten grease

Blood drying operations [e.g., animal slaughter houses]

Hydrogen sulfide (H<sub>2</sub>S) [landfill gas, paper mill gas, rotten egg etc.]

Mercaptans [cause of natural gas odor]

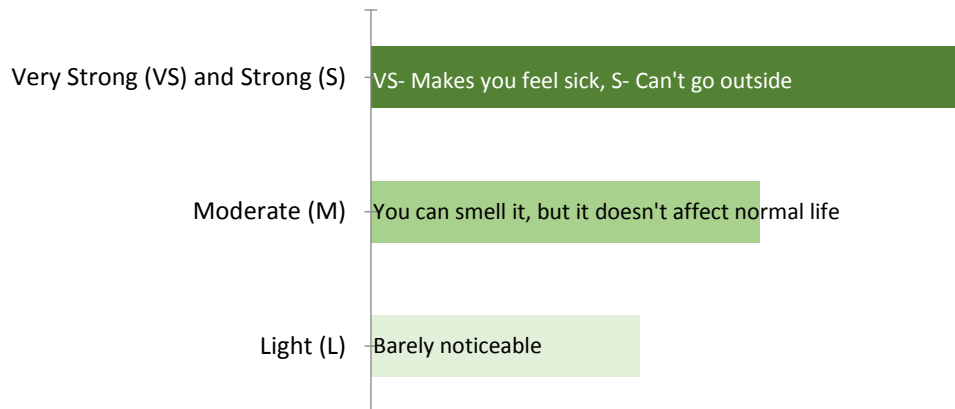
## 2. Choose the duration of the environmental odor.

How long does the odor last?

- 1 minute
- 10 minutes
- 1 hour
- 4 hours
- More than 12 hours

3. Choose the intensity level of the odor.

How strong is the odor?



4. Choose the frequency of the odor.

How often do you smell the odor?

- Once
- Daily
- Weekly
- Monthly
- Every 3 months

## Preliminary assessment of nuisance environmental odors

After working through the FIDO steps, you may want to determine whether the environmental odor could be considered a nuisance. Start by finding the FIDO page with the odor's offensiveness level and follow the steps provided.

- **Highly offensive odors**
- **Offensive odors**
- **Unpleasant odors**
- **Not unpleasant odors**

## Highly Offensive Odors

1. In the table below, first find the environmental odor's duration. Then follow that row across the table until you come to the column that matches the odor's frequency.
2. Look at the letters in each table box. They stand for the intensity of the odor (VS=Very Strong; S=Strong; M=Moderate; L= Light).
  - a. If the level you chose for the environmental odor intensity (VS, S, M, or L) is listed in that table box, then the environmental odor could be a nuisance and interfere with normal life. If you think the odor could be a nuisance, you may want to take your odor diary to your local health department or code enforcement agency and request an odor investigation<sup>2</sup>.
  - b. If the level you chose for the intensity of the odor is not listed in that table box or is listed as N/A, then the odor is unlikely to be a nuisance.

### Use for Highly Offensive Odors only

		Frequency				
		Single occurrence	Quarterly	Monthly	Weekly	Daily
Duration	1 minute	NA	NA	VS	VS	M, S, VS
	10 minutes	NA	VS	S, VS	M, S, VS	L, M, S, VS
	1 hour	VS	S, VS	M, S, VS	L, M, S, VS	L, M, S, VS
	4 hours	S, VS	M, S, VS	L, M, S, VS	L, M, S, VS	L, M, S, VS
	12+ hours	M, S, VS	L, M, S, VS	L, M, S, VS	L, M, S, VS	L, M, S, VS

### Example:

A week ago you walked outside your house and smelled rotten eggs. You've noticed this usually happens *once a month* for about *ten minutes*, and you think the odor comes from the landfill down the road.

In FIDO step 3, you decide the intensity is *moderate* because you can still go about your daily life as usual. In step 1, you find that landfill gas like hydrogen sulfide is a *highly offensive* odor.

In the table above, you first find the duration of the smell (*10 minutes*). Then you follow the row across the table until you come to the box with the frequency that you smell the odor (*monthly*). The outlined box says the odor must be of at least *strong* intensity to be considered a nuisance. You have already decided that the odor is of *moderate* intensity, so the odor is unlikely to be a nuisance.

Now let's assume you decide in step 3 that the odor is *strong*. You can't go for your afternoon walk, but must stay inside because of the strong odor. In this case the odor is likely to be a nuisance. You may want to change your habits to avoid the odor (for example, go for morning walks). You may also decide to contact your local health official or code enforcement agency.

<sup>4</sup> Many agencies are using a field olfactometer; a machine that objectively measures the amount of an odor or an odor intensity reference scale (OIRS) using n-butanol as the odorant.

## Offensive Odors

- In the table below, first find the environmental odor's duration. Then follow that row across the table until you come to the column that matches the odor's frequency.
- Look at the letters in each table box. They stand for the intensity of the odor (VS=Very Strong; S=Strong; M=Moderate; L= Light).
  - If the level you chose for the environmental odor intensity (VS, S, M, or L) is listed in that table box, then the environmental odor could be a nuisance and interfere with normal life. If you think the odor could be a nuisance, you may want to take your odor diary to your local health department or code enforcement agency and request an odor investigation<sup>2</sup>.
  - If the level you chose for the intensity of the odor is not listed in that table box or is listed as N/A, then the odor is unlikely to be a nuisance.

### Use for Offensive Odors only

		Frequency				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
Duration	1 minute	NA	NA	NA	VS	S, VS
	10 minutes	NA	NA	VS	S, VS	M, S, VS
	1 hour	NA	VS	S, VS	M, S, VS	L, M, S, VS
	4 hours	VS	S, VS	M, S, VS	L, M, S, VS	L, M, S, VS
	12+ hours	S, VS	M, S, VS	L, M, S, VS	L, M, S, VS	L, M, S, VS

### Example:

A week ago you walked outside your house and got a whiff of the hog farm down the road. You've noticed this usually happens *once a month* for *the entire afternoon*.

In FIDO step 3, you decide the intensity is *moderate* because you can still go about your daily life as usual, but the hog farm smells really bad. In step 1, you find out that hog or poultry farms can create *offensive* odors.

In the table above, you first find the duration of the smell (*four hours*). Then you follow the row across the table until you come to the box with the frequency that you smell the odor (*monthly*). The outlined box says your odor must be of at least *moderate* intensity or stronger to be considered a nuisance. You have already decided that your odor is of *moderate* intensity, so your odor is likely to be a nuisance. You may want to change your habits to avoid the odor (for example., keep your windows closed). You may also decide to contact your local health official or code enforcement agency.

Now let's assume you decide in FIDO step 3 that the odor is *light*. You barely smell it throughout the afternoon. In this case the odor is unlikely to be a nuisance.

<sup>3</sup> Many agencies are using a field olfactometer; a machine that objectively measures the amount of an odor or an odor intensity reference scale (OIRS) using n-butanol as the odorant.



## Unpleasant Odors

- In the table below, first find the environmental odor's duration. Then follow that row across the table until you come to the column that matches the odor's frequency.
- Look at the letters in each table box. They stand for the intensity of the odor (VS=Very Strong; S=Strong; M=Moderate; L= Light).
  - If the level you chose for the environmental odor intensity (VS, S, M, or L) is listed in that table box, then the environmental odor could be a nuisance and interfere with normal life. If you think the odor could be a nuisance, you may want to take your odor diary to your local health department or code enforcement agency and request an odor investigation<sup>2</sup>.
  - If the level you chose for the intensity of the odor is not listed in that table box or is listed as N/A, then the odor is unlikely to be a nuisance.

### Use for Unpleasant Odors only

		Frequency				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
Duration	1 minute	NA	NA	NA	NA	VS
	10 minutes	NA	NA	NA	VS	S, VS
	1 hour	NA	NA	VS	S, VS	M, S, VS
	4 hours	NA	VS	S, VS	M, S, VS	L, M, S, VS
	12+ hours	VS	S, VS	M, S, VS	L, M, S, VS	L, M, S, VS

### Example:

You live in an apartment building next to a gas station. You've noticed that during the afternoon traffic rush for about one hour each day you can smell gasoline or diesel fuel when you go outside.

The odor is barely there, so in FIDO step 3, you decide the intensity is light. In step 1, you find gasoline and diesel fuel in the column for unpleasant odors.

In the table above, you first find the duration of the odor (1 hour). Then you follow the row across the table until you come to the box with the frequency that you smell the odor (daily). The outlined box says your odor must be of at least moderate intensity or stronger to be considered a nuisance. You have already decided that the odor's intensity is light, so your odor is unlikely to be a nuisance.

Now let's assume you decide in FIDO step 3 that the odor is strong. You can't go for your afternoon walk and must stay inside. In that case, the odor is likely to be a nuisance. You may want to change your habits to avoid the odor (for example., take morning walks instead). You may also decide to contact your local health official or code enforcement agency.

<sup>2</sup> Many agencies are using a field olfactometer; a machine that objectively measures the amount of an odor or an odor intensity reference scale (OIRS) using n-butanol as the odorant.

## Not Unpleasant Odors

- In the table below, first find the environmental odor's duration. Then follow that row across the table until you come to the column that matches the odor's frequency.
- Look at the letters in each table box. They stand for the intensity of the odor (VS=Very Strong; S=Strong; M=Moderate; L= Light).
  - If the level you chose for the environmental odor intensity (VS, S, M, or L) is listed in that table box, then the environmental odor could be a nuisance and interfere with normal life. If you think the odor could be a nuisance, you may want to take your odor diary to your local health department or code enforcement agency and request an odor investigation<sup>5</sup>.
  - If the level you chose for the intensity of the odor is not listed in that table box or is listed as N/A, then the odor is unlikely to be a nuisance.

### Use for Not Unpleasant Odors only

		Frequency				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
Duration	1 minute	NA	NA	NA	NA	NA
	10 minutes	NA	NA	NA	NA	NA
	1 hour	NA	NA	NA	NA	VS
	4 hours	NA	NA	NA	VS	S, VS
	12+ hours	NA	NA	VS	S, VS	M, S, VS

### Example:

When you bought your apartment above the coffee shop two months ago, you thought it was the perfect breakfast solution. Now, you're not so sure. Every day from 4:00 in the morning until 8:00 at night, you smell roasting coffee and baked goods. In step 3, you decide the intensity is moderate because you can still go about your daily life as usual, but you do get tired of smelling roasting coffee all day! In step 1, you decide these odors are not unpleasant.

In the table above, you first find the duration of the odor (12+ hours). Then you follow the row across the table until you come to the box for the frequency that you smell the odor (daily). The outlined box says your odor must be of at least moderate intensity or stronger to be considered a nuisance. You have already decided that the odor's intensity is moderate, so the odor is likely to be a nuisance. You may want to change your habits to avoid the odor (for example, keep your windows shut, find another apartment). You may also decide to contact your local health official or code enforcement agency for other solutions.

If you decide in step 3 that the odor is light because you barely smell it on and off throughout the day, then the odor is unlikely to be a nuisance.

<sup>5</sup> Many agencies are using a field olfactometer; a machine that objectively measures the amount of an odor or an odor intensity reference scale (OIRS) using n-butanol as the odorant.

## Next Steps

Now that you have investigated and recorded the environmental odor concern, what's next? **If you think the odor may be a nuisance**, you may want to contact your local health department or code enforcement agency. You can turn in your odor diary and discuss the situation and options. The department or agency may conduct an investigation to help determine what should be done next, according to local legislation.

**Even if you determined that the odor may not be a nuisance**, if you are still concerned about either the source of the odor or its effect on your health, contact the appropriate agency in your area to explore this issue further.

*Here is some information on methods often used in odor investigations*

An odor investigation may involve determining the intensity using one of two methods: either an odor intensity reference scale (OIRS) using n-butanol as the odorant, or a field olfactometer like the Nasal Ranger® ([St. Croix Sensory, Inc.](#)).

The OIRS compares the problem odor to varying levels of n-butanol intensity. Investigators are trained in this method by first analyzing odor sensitivity, and then explaining the OIRS process. Investigations compare the odor in the ambient air to set amounts of n-butanol. The investigator usually wears a carbon-filtering mask between each sample to prevent them from becoming adapted to the smells. Below is a five-point OIRS which can be used to determine the intensity of the problem odor.

5-point Odor Intensity Reference Scale (OIRS)	
Reference Level	n-Butanol PPM in Air
0	0
1	25
2	75
3	225
4	675
5	2025

The field olfactometer method determines the Dilution-to-Threshold (D/T) of the odor, which is a measure of how diluted with fresh air the odor can be while still being able to smell the odor. The larger the D/T recorded, the more intense an odor is (e.g., 30 D/T is more intense than 7 D/T). Common thresholds for problem odors are greater than either 7 D/T or 15 D/T, depending on the type of land-use in the area where the odor occurs. Investigators

- **Begin with the highest D/T ratio on the field olfactometer (e.g., 60 D/T on the Nasal Ranger®).**
- **Reduce the D/T until they can detect the odor.**
- **Repeat the process for consistency. The D/T where they first detect the odor is the value used in the intensity scale below.**

Training in one of these two methods is central to accurately determining and placing the odor intensity along the scale below. The intensity scale is for general use and may need to be adjusted up or down depending on local legislation. Some states declare an odor a nuisance once it passes a certain D/T ratio without needing to know the frequency or duration<sup>1</sup>.

Intensity Scale	VS	S	M	L	VL
	Very Strong	Strong	Moderate	Light	Very Light
<i>OIRS (5-point reference scale)</i>	5	4	3	2	1
<i>Field Olfactometer (D/T)</i>	15	7	4	2	0

**For more information:**

[ATSDR Environmental Odors](#)

**Questions:**

[environmentalodors@cdc.gov](mailto:environmentalodors@cdc.gov)

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<sup>1</sup> Maine Department of Environmental Protection. "Report on Odor and Gas Management at Solid Waste Facilities." Division of Solid Waste Management. January 2009. *Includes a table of odor legislation by state.*

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<sup>6</sup> This document was adapted from: [Texas Commission on Environmental Quality: Odor Complaint Investigation Procedures](#). The document is no longer available online. The information in this report is relevant for odor investigations in all states.