

# 1,4-Dioxane Groundwater Contamination

IN WASHTENAW COUNTY, MICHIGAN



There is an area in Washtenaw County, which includes parts of Scio Township and western Ann Arbor, that has a plume of 1,4-dioxane underground. A **plume** happens when a chemical is moving underground in soil or water. In this case, the chemical 1,4-dioxane is moving through groundwater. This is a concern because wells draw groundwater for use in homes and businesses in this area.

This plume is not a new problem. From 1966 until 1986, Gelman Sciences (now Pall Corporation) used 1,4-dioxane in their manufacturing process. In 1985, 1,4-dioxane was discovered in residential drinking water wells in the area. Unfortunately, 1,4-dioxane does not break down quickly in water. The plume still exists, even after all this time.

The Michigan Department of Environmental Quality (MDEQ) and Washtenaw County Public Health have been tracking this plume for over 20 years and will continue to track it. Since it was discovered, environmental and public health officials have been working with people who live and work in the area of the plume to make sure they are informed about the situation and are aware of testing results.

For a detailed map of this area, visit <http://card.ewashtenaw.org> or see page 5.

## Frequently Asked Questions

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### What is 1,4-dioxane?

1,4-dioxane is a chemical that can be found in paint strippers, glues, pesticides, and many other things. It is also found in some makeup, lotions, detergents, bath products, shampoos, medicines, and foods and food additives.

1,4-dioxane is not always added to these products on purpose, but it may show up in very small amounts in some of the things you use. Ingredients to look for include PEG, polyethylene, polyethylene glycol, and polyoxyethylene. Also, ingredients with the word or syllable “-eth,” or “-oxynol” may contain 1,4-dioxane. Based on current science, the amount of 1,4-dioxane in these products is not likely to be harmful, even if you use them every day.

### What can 1,4-dioxane do to my health?

You can be exposed to 1,4-dioxane by drinking it, breathing it in, or getting it on your skin. The US Environmental Protection Agency (EPA) and the US Department of Health and Human Service’s National Toxicology Program have linked drinking and breathing in 1,4-dioxane to the development of cancer based on studies on animals. Being exposed to levels of 1,4-dioxane over a long time is also linked to kidney and liver damage in laboratory tests in rodents. Limited information is available on potential risks to humans from 1,4-dioxane exposure.

### How do I know if 1,4-dioxane is in my drinking water?

**Do you live or work in the plume area and get your water from a well? (See map on page 5)**

If you live in the area south of M-14, north of West Liberty Street, east of Wagner Road, and west of the Huron River, you might live in the area called the **Prohibition Zone**.

**Properties in the Prohibition Zone are connected to the City of Ann Arbor’s municipal water supply and should not be using well water for any reason. The MDEQ has contacted the property owners in the Prohibition Zone. If you have not been contacted, you’re not likely in the Prohibition Zone or you are already on city water. You can call the MDEQ or Washtenaw County Public Health to be sure. 1,4-dioxane has not been detected in the City of Ann Arbor’s drinking water.**

Properties in other areas of the plume or near the plume edges that use drinking water wells are tested for 1,4-dioxane on a regular basis.

### Is your water being tested?

The MDEQ has contacted you if your property is located directly over the plume or near the edges of the plume. If you have allowed it, your water has been tested by the MDEQ. The frequency with which your water is tested depends on your location. You will get your results from every test in the mail. The MDEQ also has a database of monitoring results on their website, available at these links:

- [http://www.michigan.gov/deq/0,4561,7-135-3311\\_4109\\_9846-71595--,00.html](http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846-71595--,00.html)
- <http://tinyurl.com/zj5x3fh>

If your water tests show a level of 1,4-dioxane above the current cleanup criterion set by the MDEQ, other sources of water will be provided to you. See “1,4-dioxane has been detected in my well water” below.

### None of these things apply to me, but I am using well water.

If you have not been contacted or your well water isn't being tested, but you have concerns, you can call Jennifer Conn at Washtenaw County Public Health or Dan Hamel at the MDEQ to talk about where you live or work and if your well water may be at risk.

**If you have a well and want to know if your water is affected by the plume, please contact:**

<p><b>Jennifer Conn</b> Washtenaw County Public Health (734) 222-3855 connj@ewashtenaw.org</p>	<p><b>Dan Hamel</b> MDEQ (517) 780-7832 hameld@michigan.gov</p>
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### 1,4-dioxane has been detected in my well water. What does the level mean?

In areas around the state where there is contamination, the MDEQ sets cleanup levels that help protect public health. This level is called a **cleanup criterion**. In the past, the cleanup criterion for 1,4-dioxane in drinking water was 85 parts per billion (ppb). Based on updated science, the MDEQ has developed a draft drinking water cleanup criterion of at or below 7.2 ppb for 1,4-dioxane.

The MDEQ is proposing the draft drinking water cleanup criterion using updated cancer risk estimates determined by the US Environmental Protection Agency (EPA). The MDEQ used the EPA's Integrated Risk Information System's number because it is the best available science and protects everyone – including children – when people drink water with 1,4-dioxane at or below this level.

**Water with 1,4-dioxane levels at or below 7.2 ppb** – Based on current science, if your test level for 1,4-dioxane is at or below the draft MDEQ drinking water criterion of 7.2 ppb, your risk of having health problems from drinking water is considered low. You may choose to use other sources of water, but these sources will not be provided by the MDEQ.

**Water with 1,4-dioxane levels above 7.2 ppb** – If your test level for 1,4-dioxane is above 7.2 ppb, the MDEQ will contact you to provide bottled water for drinking until city water is available.

### Which wells are tested?

Many wells are regularly tested for 1,4-dioxane. To see a map of testing locations, visit: <http://card.ewashtenaw.org>

### Monitoring Wells

Pall Corporation currently has 257 monitoring wells. Monitoring wells are wells that were put in specifically to track the movement of the plume. Existing residential wells that are no longer used for drinking water are also used for monitoring. Monitoring wells are sampled at various times throughout the year. Some are tested monthly, while others are tested every three months, every six months, or once a year. No one drinks the water from these monitoring wells.

## Homes and Businesses in the Plume Area

There are 34 drinking water wells at homes and businesses in the plume area that are tested every three months, every six months, or once a year, depending on location. Seven of these wells have tested positive for 1,4-dioxane at some point in their monitoring history. Of these seven wells, six have shown levels of 1 to 3 ppb of 1,4-dioxane. These levels are less than the draft MDEQ drinking water criterion of 7.2 ppb. Only one well, serving a home and two businesses, tested above the new MDEQ draft drinking water criterion. This location was connected to city water in early March 2016. 1,4-dioxane has not been detected in the City of Ann Arbor's drinking water.

In 2014, to be sure the plume wasn't contaminating other drinking water wells, the MDEQ tested 90 additional wells at homes and businesses near the western edge of the plume. 1,4-dioxane was not detected in any of these samples.

In 2016, the MDEQ is planning to test another 38 wells north of the plume to be sure the plume has not impacted these water supplies. The results will be available on the MDEQ's website for the project, available at these links:

- [http://www.michigan.gov/deq/0,4561,7-135-3311\\_4109\\_9846-71595--,00.html](http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846-71595--,00.html)
- <http://tinyurl.com/zj5x3fh>

## What if I want to test my water?

If your water is not already being tested but you would like to test it, you are responsible for any cost. There are three laboratories located near our community that can run tests for 1,4-dioxane. The laboratories are listed below:

<b>Ann Arbor Technical Services*</b> 290 S. Wagner Ann Arbor, MI 48103 (734) 995-0995 info@AnnArborTechnicalServices.com	<b>Brighton Analytical*</b> 2105 Pless Drive Brighton, MI 48114 (810) 229-7575 bai-brighton@sbcglobal.net	<b>MDEQ Drinking Water Laboratory</b> P.O. Box 30270 Lansing, MI 48909 (517) 335-8184 deq-rrd-dw-bottles@michigan.gov
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**\*Please note that only the MDEQ Drinking Water Laboratory provides copies of results to Washtenaw County Public Health. If you use any other laboratory and you would like your results to be kept on file with Washtenaw County, please contact Jennifer Conn with Washtenaw County Public Health.**

## Is there a filter I can put on my faucet to remove 1,4-dioxane?

Unfortunately, filters such as carbon filters and reverse osmosis filters cannot effectively remove 1,4-dioxane.

## Can I use my well water for drinking?

If your well water has been tested and is at or below the draft MDEQ drinking water criterion of 7.2 ppb, it is considered okay to use the water for drinking (including making things like tea and coffee). Limited information is available on potential risks to infants from 1,4-dioxane exposure. If 1,4-dioxane is detected in your well water, but is at or below the draft MDEQ drinking water criterion of 7.2 ppb, it is recommended you talk with your pediatrician and use bottled water for preparation of infant formula.

If your well water tests above the draft MDEQ drinking water criterion of 7.2 ppb, you will be provided with bottled water by the MDEQ until you can be connected to city water.

## Can I use my well water for bathing, washing hands, or laundry?

If your well water has been tested and is at or below the draft MDEQ drinking water criterion of 7.2 ppb, it is considered okay to use the water for things like bathing, washing hands, and doing laundry. If your well water is above the draft MDEQ drinking water criterion of 7.2 ppb, you will receive bottled water for drinking until you can be connected to city water. You should contact the MDEQ or Washtenaw County Public Health for information and direction on using your water for bathing, washing hands, and laundry.

## Should I be concerned about breastfeeding my child if I drink water with 1,4-dioxane?

Not much research has been done on 1,4-dioxane in breast milk. If you are breastfeeding, it is recommended you talk with your healthcare provider and drink bottled water.

## Water comes into my basement. Do I need to worry about 1,4-dioxane in the water?

Water coming into basements may come from several things. It is common for surface water, such as rain or snow melt, to enter basements. Surface water is not likely to be contaminated with 1,4-dioxane. If you live in an area with a high water table, groundwater may seep into your basement. Research has not been done to determine what risk there might be in this situation.

## Can I use my well water in a humidifier?

Using well water in a humidifier is not recommended. Most manufacturers say to fill your humidifier with distilled water. Distilled water is cleaner to breathe and will also slow the build-up of scale in your humidifier, possibly making it last longer.

## What if I want more information about the 1,4-dioxane plume?

Since 2006, Washtenaw County Public Health has participated in a community group called the Coalition for Action on Remediation of Dioxane (CARD). CARD is a partnership of local governments and citizens that develops strategies to address the groundwater contamination from the 1,4-dioxane plume. The group meets monthly, and meetings are open to the public. In addition, there is an email listserv you can join to stay updated on this issue. For more information about CARD or to sign up for the listserv, please visit: <http://card.ewashtenaw.org>

If you have additional questions or concerns about 1,4-dioxane, please contact:

<p><b>Jennifer Conn</b> Washtenaw County Public Health (734) 222-3855 <a href="mailto:connj@ewashtenaw.org">connj@ewashtenaw.org</a></p>	<p><b>Dan Hamel</b> MDEQ (517) 780-7832 <a href="mailto:hameld@michigan.gov">hameld@michigan.gov</a></p>
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## References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for 1,4-Dioxane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=955&tid=199>

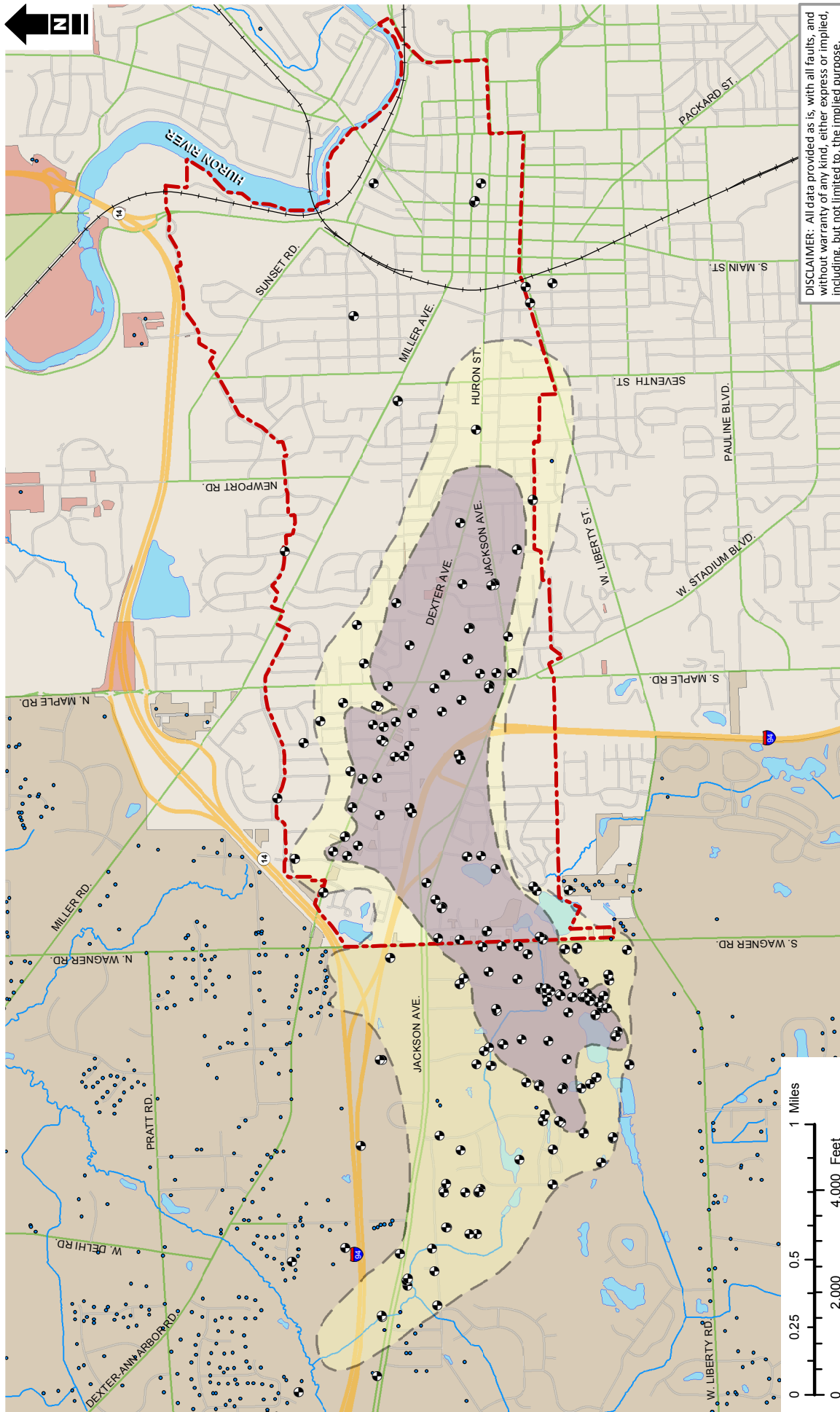
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# 1,4-Dioxane Plume Map Washtenaw County, Michigan



DISCLAIMER: All data provided as is, with all faults, and without warranty of any kind, either express or implied, including, but not limited to, the implied purpose.

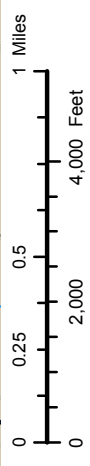
MAP PRODUCED BY:  
Washtenaw County Public Health  
Washtenaw County, Michigan

SOURCES:  
MIGDL  
MDEO Database  
Washtenaw County GIS

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**KEY**

- Monitoring Well
- Home/Business Well
- Prohibition Zone
- Estimated Plume >85 ppb
- Estimated Plume between 1 and 85 ppb\*
- Scio Township
- Ann Arbor Township
- Barton Hills Village
- City of Ann Arbor



\* Represents an estimation of the 1,4-dioxane plume based on sampling locations that have detections of 1,4-dioxane greater than 1 part per billion (ppb) or sampling locations with historical detections greater than 1 ppb that may currently be below detectable levels.