



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
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REMEDIATION AND REDEVELOPMENT DIVISION

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## FACT SHEET

### Prohibition Zone to Restrict Use of Groundwater

Gelman Sciences, Inc. Unit E Aquifer  
Groundwater Contamination  
Washtenaw County

#### CURRENT STATUS

On May 17, 2005, the Washtenaw County Circuit Court issued an order (Order) to restrict the use of groundwater in portions of the City of Ann Arbor (City), and Ann Arbor and Scio Townships. The purpose of the Order is to prevent human exposure to groundwater that is or may become contaminated with 1,4-dioxane (see *1-4-Dioxane*) at levels that exceed acceptable criteria (see *Relevant Cleanup Criteria*) from the Gelman Sciences site. The restricted area is shown on the attached Prohibition Zone (PZ) Boundary map. A few of the properties in this area receive their drinking water from private wells; most areas are already connected to the City water supply. See *Unit E Plume History* for an explanation of the events that led to issuance of the Order.

#### KEY COURT ORDER FACTS FOR RESIDENTS AND PROPERTY OWNERS

- Water supply wells for any purpose may not be installed within the PZ, nor may water from within the PZ be consumed or used, with limited exceptions (see next section).
- All private water supply wells within the PZ must be properly abandoned, with certain exceptions, at the expense of Pall Life Sciences (PLS), Gelman Sciences successor.
- Very few properties in the PZ are known to rely on a private water supply well for drinking water; any that do will be connected to the municipal water supply at PLS expense, subject to limited exceptions.
- Residents and property owners within the PZ must notify the DEQ of the existence of any water supply well within the PZ that has not been properly abandoned, whether or not it is currently used for any purpose. PLS is also required to identify wells (see *Future Work Required of Pall Life Sciences*).

#### EXCEPTIONS TO COURT ORDER

The exceptions to consumption or use of groundwater in the PZ are listed in paragraph 5 of the Order, and are quoted below:

(a) groundwater extraction and monitoring wells as part of response activities approved by MDEQ or otherwise authorized under Parts 201 or 213 of NREPA<sup>1</sup>, or other legal authority.

(b) dewatering wells for lawful construction or maintenance activities, provided that appropriate measures are taken to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a.

(c) wells supplying heat pump systems that either operate in a closed loop system, or if not, are demonstrated to operate in a manner sufficient to prevent unacceptable human or environmental exposures to hazardous substances and comply with MCL 324.20107a.

(d) emergency measures necessary to protect public health, safety, welfare or the environment.

(e) any existing water supply well that has been demonstrated, on a case-by-case basis and with the written approval of the MDEQ, to draw water from a formation that is not likely to become contaminated with 1,4-dioxane emanating from the PLS facility. Such wells shall be monitored for 1,4-dioxane by PLS at a frequency determined by the MDEQ.

#### BRIEF SITE HISTORY

The source of the contamination is property previously owned by Gelman Sciences, Inc., located on Wagner Road south of Jackson Road in Scio Township. Pall Life Sciences (PLS), the successor of Gelman Sciences, Inc., is now responsible for addressing the contamination. From 1966 to 1986, the company used 1,4-dioxane in the manufacture of

<sup>1</sup> Natural Resource and Environmental Protection Act, 1994 PA 451, as amended

medical filters. Various methods of disposal and waste handling during this period resulted in releases to the environment that caused widespread groundwater contamination.

In the fall of 1985, the first contaminated private water supply wells were discovered in the vicinity of the PLS property, and additional well sampling was done. Bottled water was provided to affected residences and businesses until the municipal water supply was extended into these areas. Beginning in 1986, investigations by the company identified soil contamination on the PLS property and groundwater contamination extending off the property.

PLS removed much of the contaminated soil and began remediation of a portion of the groundwater contamination in 1993. Comprehensive remediation of two shallow aquifers has been ongoing since 1997. This water is piped from extraction wells to PLS's treatment building, treated, then discharged to the Honey Creek Tributary. This remediation has significantly decreased the concentration and mass of 1,4-dioxane contamination in the shallow aquifers.

During an investigation in the spring of 2001, it was discovered that there was no confining layer of clay separating the two shallower aquifers from a deeper aquifer (Unit E Aquifer) in an area west of the PLS property. Additional investigation found that the Unit E Aquifer was contaminated and groundwater in it is flowing under the Maple Village Shopping Center and Veterans Park, and is expected to continue generally in an easterly direction. The exact path of the plume will be determined by investigation and monitoring to be performed by PLS with DEQ oversight. Since May 2002, PLS has been extracting contaminated groundwater from the contaminated Unit E Aquifer (Unit E Plume) through two extraction wells on its property. Low concentrations of 1,4-dioxane have been found in the City's Northwest Supply Well, and that well is no longer being used.

### 1,4-DIOXANE

The contaminant at this site, 1,4-dioxane, is completely soluble in water and is held together by strong bonds that prevent it from breaking down readily in groundwater. The complex geology in the vicinity of the PLS property also contributes to the widespread nature of the contamination. Toxicity testing has determined that high doses of 1,4-dioxane cause cancer in mice, and it is

presumed to be a human carcinogen through long-term exposure to low doses.

### RELEVANT CLEANUP CRITERIA

As specified by state law, the relevant cleanup criteria for 1,4-dioxane in groundwater are dependent on the potential exposure pathway. The generic residential cleanup criterion (GRCC) for groundwater used for drinking water is 85 parts per billion (ppb), and is the concentration to which groundwater must be remediated to allow for unrestricted use, including use as drinking water. The GRCC is based on a 30-year exposure to drinking water, accepting an increased cancer risk of 1 in 100,000 persons exposed. When restrictions are placed on use of the groundwater, such as in the Order, the only remaining relevant exposure pathway at this site is groundwater discharging to surface water. The Unit E Plume is likely to discharge to the Huron River. The generic criterion for discharge of contaminated groundwater to surface water for 1,4-dioxane is 2,800 ppb. This criterion would apply if the contamination discharges to the river downstream of the City of Ann Arbor's water supply intake at Barton Pond. If the investigation finds that the Unit E Plume will discharge into Barton Pond, where the City water intake is located, the relevant criterion would be 34 ppb. See *Future Work Required of PLS*.

### UNIT E PLUME HISTORY

- 2 ppb of 1,4-dioxane was discovered in the City's Northwest Supply Well at Montgomery & Bemidji in March 2001 (currently 4 ppb);
- the City turned the well off immediately;
- 1,4-dioxane contamination flowing into Ann Arbor from the Gelman site was confirmed by investigations later in 2001;
- this contamination is in the Unit E Aquifer, which was previously believed to be protected from the shallower contamination by a continuous clay layer;
- after much investigation, concentrations of up to 2,000 ppb have been identified under the Maple Village Shopping Center, just west of Maple Road, between Jackson and Dexter Roads;
- for reasons not entirely understood, concentrations are much lower to the east, under Veterans Park, mostly below 200 ppb;
- the DEQ's preferred option was a full cleanup, which would have required extraction wells and pipelines in west side neighborhoods;

- the DEQ approach was opposed by residents of those neighborhoods, but supported by some others in the projected path of the Unit E Plume (through downtown Ann Arbor to the Huron River), including Ann Arbor Township, which has a few township islands within the City and areas east of the Huron River, that are not connected to the municipal water supply;
- the PLS alternative to allow the contamination to migrate is an option allowed by state law, provided certain conditions are in place to prevent unacceptable exposures to human health and the environment, including an institutional control to prevent use of the groundwater in the expected path of the Unit E Plume, including a buffer area (the PZ will serve as the institutional control);
- one of the DEQ's conditions for allowing the migration of contamination was that the City's Northwest Supply Well should be in the PZ, including abandonment and replacement of the well at PLS expense;
- PLS objected to the City well being included in the PZ and the Court ruled in their favor, saying it will be resolved in a separate lawsuit the City filed against PLS regarding the contamination of the City well.

**RELATIONSHIP OF GELMAN SCIENCES FACILITY TO PZ**

The Gelman Sciences "facility", as defined by Part 201 (Environmental Remediation) of the NREPA, includes any area where 1,4-dioxane in groundwater above the GRCC of 85 ppb is located, as well as limited areas of soil contamination above 1,500 ppb on PLS property. The Consent Judgment entered in 1992 required PLS to remediate all affected groundwater to meet the GRCC. The recent Order treats the Unit E Plume differently, but does not affect PLS's obligation to clean up the shallower aquifers addressed by the Consent Judgment.

The extent of 1,4-dioxane contamination above 85 ppb, the "facility", has been determined by monitoring wells installed and monitored by PLS on a regular basis. Inferences about the location of the plume, and thus the extent of the "facility", are based upon numerous factors including: where concentrations of 1,4-dioxane either exceed or are less than the GRCC; the space between wells measuring those concentrations; groundwater flow direction; and best professional judgment utilizing generally accepted hydrogeological principles. This

data is reviewed by the DEQ periodically to determine if the location of the "facility" has changed. The Unit E Plume, as shown on the attached PZ Boundary map, depicts the portion of the PZ that is currently known to be a "facility". The extent of this area has not changed significantly in the past year.

Section 16(1) of Part 201 relates to property that is part of a "facility", and applies only to the portion of the PZ where groundwater containing 1,4-dioxane above 85 ppb has migrated (see *Relevant Cleanup Criteria*), as well as to other areas of the Gelman Sciences "facility" where 1,4-dioxane above 85 ppb is currently located, but which are being remediated to meet the 85 ppb criterion and therefore are not required to be part of the PZ. Section 16(1) requires anyone who is on notice or has information that their property is a "facility", to disclose the general nature and extent of the contamination to future owners.

PLS is also required to notify all property owners where 1,4-dioxane in groundwater above 85 ppb is located. PLS did such a notification in September 2003 when that requirement went into effect. PLS will need to notify additional property owners as the Unit E Plume migrates.

**IF YOU SELL PROPERTY IN THE PZ**

Section 16(3) of Part 201 applies to all property within the PZ. The Order is considered a resource use restriction. Section 16(3) requires property owners to disclose resource use restrictions to future owners. In other words, owners of property within the PZ need to inform future owners that they would not have the right of unrestricted use of the groundwater beneath the property. In addition, if you sell property in the PZ that you know or believe is part of the "facility", you must also disclose the nature and extent of the contamination to future owners, as described in the previous section.

**FUTURE WORK REQUIRED OF PALL LIFE SCIENCES**

- PLS must provide municipal water to replace any private drinking water wells that are in the PZ or are found to be impacted or threatened by the Unit E Plume.
- PLS must identify and abandon all private wells (subject to certain exceptions), including irrigation wells, within the PZ at its expense, and has submitted a work plan to the DEQ to do so.

- PLS will extract, treat and reinject 200 gallons of groundwater per minute at Maple Road to prevent 1,4-dioxane above 2,800 ppb from migrating to the east. The work plan for doing so has been approved by the DEQ and should be operational later this year.
- PLS will conduct an investigation, the first phase of which the DEQ has approved, to better determine the path of the Unit E Plume. Current indications are that the plume will discharge to the Huron River downstream of Barton Pond, the location of the City's water supply intake.
- The DEQ will require ongoing monitoring of the Unit E Plume by PLS to verify that the area of the PZ is protective (the Order allows the PZ to be revised based on investigation or monitoring results). The monitoring will continue for as long as the PZ remains in effect, and additional monitoring wells will likely be installed in multiple phases, as the exact course of the plume is determined.

**DETAILED  
INFORMATION AVAILABLE**

More detailed information about this site is available on the DEQ's Gelman Sciences, Inc. web site: [www.michigan.gov/deqrrd](http://www.michigan.gov/deqrrd), scroll to Contaminated Site Lists and click on [Gelman Sciences, Inc.](#)

Additional information, along with this fact sheet, is available for review at the following locations, during regular business hours, and at the DEQ Jackson District Office, by appointment.

Ann Arbor District Library  
Downtown Library  
343 South Fifth Avenue  
734-327-4200

Scio Township Hall  
827 North Zeeb Road, Ann Arbor  
734-665-2123

City of Ann Arbor Water Utilities Department  
100 North Fifth Avenue  
Contact: Mary Gordon 734-994-8286

Washtenaw County Department of Planning and Environment  
705 North Zeeb Road, Ann Arbor  
Contact: Michael Gebhard 734-222-3855

PERTINENT DOCUMENTS  
(also on the DEQ's Gelman web site)

- 6/17/05: PLS Work Plan to Identify Wells
- 5/17/05: Court Order to Restrict Groundwater Use
- 12/17/04: Court Opinion & Order
- 9/1/04: DEQ Decision Document
- 7/04: DEQ Fact Sheet

Part 201 of the NREPA: [www.michigan.gov/deqrrd](http://www.michigan.gov/deqrrd), right column, Laws & Rules, Part 201, then click on Printer Friendly Version at top of page.

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**ROLE OF WASHTENAW COUNTY**

The Washtenaw County Department of Planning and Environment (WCDPE) has the authority and responsibility to permit installation of wells in Washtenaw County. The DEQ has been and will continue to work closely with the WCDPE to ensure that the requirements of the Order are complied with and will adequately protect human health and the environment from the contamination that will be allowed to migrate toward the Huron River. The DEQ has asked that the existence of any wells within the PZ be reported to DEQ (see below). DEQ will notify WCDPE and PLS as soon as it learns of any such wells.

**REPORT A WELL IN THE PROHIBITION ZONE  
& DIRECT QUESTIONS TO:**

**Sybil Kolon, Project Manager**  
Department of Environmental Quality  
Remediation and Redevelopment Division  
Jackson District Office  
301 E. Louis Glick Highway  
Jackson, MI 49203  
telephone: 517-780-7937  
facsimile: 517-780-7855  
e-mail: [kolons@michigan.gov](mailto:kolons@michigan.gov)

**NOTE:** It will be difficult for PLS or anyone else to identify all wells subject to the Order without the cooperation of all residents and property owners. Please report any wells in the PZ to Sybil Kolon.

# Gelman Sciences Inc. Prohibition Zone Boundary

