

**RESPONSIVENESS SUMMARY TO COMMENTS FOR THE  
PROPOSED PPG CIRCLEVILLE GROUND WATER DISCHARGE  
OHIO EPA NPDES PERMIT APPLICATION NO.: 4IN00194\*AD  
MARCH 2004**

- Hearing Comment:** “I know that pumping it into the river may be better than having it in the groundwater, but do we know that for a fact at this point?”

**Ohio EPA Response:** Pumping the water into the river is a solution that both protects the local drinking water supply and maintains concentrations in surface water significantly below Ohio Water Quality Standards. PPG plans to install two new wells and discharge the water to the Scioto River. These plans were developed to; compensate for planned declines in pumping at some of the DuPont wells, place wells at optimal locations, and expedite the groundwater remediation effort. These wells will also provide additional protection of the Earnhart Hill public water supply wells. The water pumped from these new wells resulted in the need for the new NPDES permit, the subject of the public hearing. The net change in the surface water discharge is a shift from DuPont to a new discharge under the control of PPG.

- Hearing Comment:** “So there are options out there. Anybody can look on the internet on this 1,4 dioxane and see there are remediation techniques out there. So I wonder why they’re not being addressed and just want to pump straight to the river.”

**Ohio EPA Response:** Numerous alternatives were evaluated prior to the June 2000 decision that selected this remedy. This evaluation included a public comment period which was held through December 6, 1999, along with public information session and a public hearing held on October 25, 1999 at the Circleville City Hall. Based on the extremely low concentrations detected and the water quality standards, intercepting the groundwater and pumping it to the Scioto River was determined to the most effective remediation method available. Copies of the 2000 Decision Document are available upon request.

- Hearing Comment:** “I live above it but only a quarter mile. You don’t know whether the waters going to be pumped going south, north, which way the water’s going to run when they’re going pump it?”

**Ohio EPA Response:** The proposed discharge to the Scioto River will be west of the intersection between U.S. Route 23 and Tarlton Road. The discharge to the Scioto River will be located on the eastern side of the river. Please see the attached map of the proposed discharge location.

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4. **Hearing Comment:** “I hunt, fish, trap the river all my life. I want to know if it’s going to be a danger to the fish.”

**Ohio EPA Response:** Ohio EPA has developed water quality standards for the Scioto River that are protective of fish and wildlife. In this case, the river concentration standard for 1,4 dioxane, that is protective of fish consumption, is 3,600 ug/l (micrograms per liter of water). The proposed discharge of ground water will be at, or below, a concentration of 35 ug/l, or approximately 1.0% of the standard. The 3,600 ug/l standard for nondrinking water sources, is a safe level assuming that, over their lifetime, people drink an average of 2 liters of water per day and eat an average of 17.5 grams of fish per day (three 6-ounce meals per month). The safe level is defined as causing no more than one additional cancer per 100,000 exposed people. Ohio EPA’s information on the toxicity of 1,4 dioxane to fish species indicate that fish are a thousand time less sensitive to this chemical than humans.

5. **Hearing Comment:** “..is it something that will have a genetic defect on future things?”

**Ohio EPA Response:** The Ohio EPA has no information that suggests 1,4 dioxane causes genetic defects.

6. **Hearing Comment:** “That is, will it, let’s tell like he said, will it get in the fish and do anything that’s a problem?”

**Ohio EPA Response:** Please see response to Comment #4 above.

7. **Hearing Comment:** “If you drink it will it become a problem?”

**Ohio EPA Response:** Currently the drinking water that Earnhart Hill Water and Sewer District supplies to its customers has not been affected by 1,4-dioxane. The wells and discharge proposed by PPG are designed to prevent 1,4 dioxane from becoming a problem for Earnhart Hill’s wells.

**8. Hearing Comment:** “What other solutions have been explored?”

**Ohio EPA Response:** In accordance with the December 21, 1989 consent order with Ohio EPA, PPG performed remedial investigations and a feasibility study. The feasibility study was finalized on February 25, 1999. This document was placed at the Pickaway County Public Library in Circleville for public review. This feasibility study considered 17 remedial actions ranging from no action to physical/chemical treatment. The document initially screened potential remedial technologies considering applicability, effectiveness and implementability. Those technologies which passed the initial screening were evaluated in greater detail. Treatment technologies which were evaluated in this process included physical treatment (carbon adsorption), chemical treatment (ultraviolet oxidation), and biological treatment. After selection of a preferred option, Ohio EPA developed a document entitled “Preferred Plan for the PPG Industries, Inc. Site, Circleville, Ohio” dated September 17, 1999. This document selected the following combination of remedial actions:

- Institutional & Engineering Controls;
- Ground Water Extraction; and
- Long-Term Monitoring.

An information session and public hearing regarding the preferred plan was held on October 25, 1999 at the Circleville City Hall. Written comments, regarding this plan, were accepted through December 6, 1999. After considering the public response at this meeting, Ohio EPA moved ahead with a decision document dated June 26, 2000 approving the selected remedial options including ground water extraction using the DuPont wells with disposal under DuPont’s NPDES permit to the Scioto River. With changes in DuPont pumping rates, a shift to the two new PPG wells are needed to continue this remedy.

**9. Hearing Comment:** “Can this chemical leach farther north and will it?”

**Ohio EPA Response:** It is possible for the contaminated ground water to expand farther north. However, it does not appear the plume will migrate north unless current pumping that is controlling the migration of the plume is stopped or dramatically reduced. The chemical 1,4-dioxane is highly soluble in water and therefore will follow the same path that ground water takes as it flows through the aquifer. Under natural conditions (no ground water pumping in the area) the ground water, the 1,4-dioxane, would flow from the vicinity of PPG west toward the Scioto River. Withdrawal of water from the aquifer by pumping alters the natural ground water flow conditions. If DuPont was not pumping

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its wells, the proposed PPG extraction wells were not operating and the Earnhart Hill wells were the only wells in operation, it is possible that over a period of time the plume of ground water with 1,4-dioxane could begin to migrate farther north into the Earnhart Hill wellfield. The planned wells and discharge are designed to prevent this from happening.

- 10. Hearing Comment:** “Will other wells need to be drilled in the future as a result of it?”

**Ohio EPA Response:** The aquifer has been studied for over ten years by PPG’s consulting firm. Based upon information learned from ground water sampling and computer modeling, the two new wells should remediate the aquifer to required levels. Therefore, a need for additional wells is not anticipated.

- 11. Hearing Comment:** “Is there another chemical which can be used to tie up the chemical and limit it’s further leaching and/or environmental damage?”

**Ohio EPA Response:** No such chemical was identified in the Feasibility Study. This study included a comprehensive review of remedial alternatives. Please see Ohio EPA’s response to Comment No. 8 above.

- 12. Hearing Comment:** “Is there a guarantee that the 2.88 million gallons will do what they purposed to be done in eight years or will they come along a few years from now and plead their case for a higher rate”

**Ohio EPA Response:** Based on information obtained from over ten years of ground water sampling and computer ground water modeling, PPG’s consulting firm has estimated an eight-year remediation time frame. This remediation period is an engineering estimate and not a guaranteed time. Ohio EPA, currently, has no indication that increased pumping from these two wells will be needed.

- 13. Written Comment:** “Will they end up producing more contaminants once they are allowed to dump more?”

**Ohio EPA Response:** PPG is not “dumping more.” This NPDES permit will allow the ground water extraction activities to shift from the existing DuPont wells to the new PPG wells as DuPont’s ground water utilization decreases. The source of the contamination to the ground water has been eliminated. The amount of contamination to be removed will not change.

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14. **Written Comments:** “Are they correct in saying that this amount will keep the contaminants from reaching the Earnhart Hill water supply?”

**Ohio EPA Response:** PPG has indicated they do not expect contaminated ground water to reach the Earnhart Hill pumping wells. The two proposed ground water wells are designed to prevent that from happening. PPG is regularly sampling and reporting to the Ohio EPA the results from several monitoring wells that would allow prediction of such impact. These results will provide an early warning if additional action is needed.

15. **Written Comment:** “What happens to the aquatic life where it first enters the river?”

**Ohio EPA Response:** See response to Comment No. 8 above.

16. **Written Comment:** “We are concerned about the environmental impact of this proposal. We wonder if this is the best solution or simply the most economical.”

**Ohio EPA Response:** Remedy selection in the February 25, 1999 Feasibility Study, is discussed above in the Ohio EPA response to comment #8. Ohio EPA based it’s remedy selection, in the final decision document, on the eight evaluation criteria listed below:

- overall protection of human health and the environment;
- compliance with regulatory requirements;
- short-term effectiveness;
- long-term effectiveness and permanence;
- reduction of toxicity, mobility or volume through treatment;
- implementability;
- cost; and
- community acceptance.

17. **Written Comment:** “We also wonder if this will adversely affect the natural flow of the Scioto River.”

**Ohio EPA Response:** It is not anticipated that this flow will adversely affect the natural flow of the Scioto River since the proposed discharge will take the place of the flow that was being discharged from the Du Pont facility located downstream. Based on estimated low flow conditions, the proposed discharge would be approximately 2.5% of the total

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stream flow. However, given planned reduction in Du Pont discharges, there may no change.

- 18. Written Comment:** “Have the residents and businesses down stream south of Circleville been notified 1,4-dioxane is being added to the Scioto River?”

**Ohio EPA Response:** The Ohio Antidegradation Rule requires Ohio EPA to public notice the receipt of any application for a new discharge, and/or any public hearing for that new discharge, in the largest circulated newspaper in the county of origin. Additionally, Ohio EPA also sent notices to the Pickaway County Health Department, the Pickaway County Commissioners, Pickaway County Regional Planning Commission, all incorporated villages and cities in Pickaway County, as well as Ohio Department of Nature Resources, Division of Wildlife, various sports and environmental groups.

- 19. Written Comment:** “Has the water been tested before it reaches the Circleville area to determine the chemicals which already exist in the Scioto River, so a determination can be made to what total effect adding the 1,4-dioxane to the river will have?”

**Ohio EPA Response:** In addition to ground water sampling, PPG’s consulting engineer has also performed sampling of the Scioto River. This work was performed in accordance with the “Long Term Goundwater Monitoring Plan” dated February 28, 2002. This plan was developed in accordance with the June 26, 2000 Decision Document. The Scioto River sampling has been performed upstream of the existing DuPont groundwater discharge. The analytical results did not detect 1,4-dioxane in these upstream samples. Therefore, there should be no additive effect with the proposed discharge.

- 20. Written Comment:** “Will the 1,4 dioxane contaminate area wells along the Scioto River?”

**Ohio EPA Response:** No, the 1,4-dioxane will not contaminate area wells along the Scioto River. 1,4-dioxane is highly soluble in water, therefore when the ground water is discharged into the Scioto River at a concentration already well below the Ohio water quality standards, the chemical is quickly diluted, further lowering the concentration. In order for any area well(s) along the Scioto River to be affected by 1,4-dioxane that has been discharged into the river, the well(s) must be capable of pumping an extremely large volume of water in order to pull water from the river into the well intake. There are currently no wells in the area that are capable of pumping at such high rates. Furthermore, if wells capable of high rates were in the area, dilution would likely have reduced the 1,4-dioxane concentration below detectable limits and well below the levels

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of concern. Infact, sampling results to date indicate that 1,4 dioxane was not detected below the current Du Pont discharge.

- 21. Written Comment:** “What effect will 1,4 dioxane have on the wildlife and aquatic species?”

**Ohio EPA Response:** Please see the response to Comment No. 4 above.

- 22. Written Comment:** “What effect will the river level have during a dry season or flooding? Will flooding force contaminated water into other streams and waterways? What effect will flooding with the contaminate have on farm land? Could it result in farmland becoming unfit for growing crops?”

**Ohio EPA Response:** Because of the extremely low concentrations involved no impacts are anticipated at either high or low flow conditions. Also, no impacts on crops are anticipated.

- 23. Written Comment:** “What effect does temperatures have on 1,4 dioxane? (90 degree summer temperatures) Safety (MSDS) data lists the stability of Dioxane ‘Highly flammable - note wide explosive range. May form explosive peroxides in storage (rate of formation increased by heating, evaporation or exposure to light).’”

**Ohio EPA Response:** MSDS’s are developed for pure chemicals, with no dilution. Given the extremely diluted nature of the contamination, there are no expected affects from temperature, such as explosions.

- 24. Written Comment:** “Has there been a survey by the Ohio Department of Health to determine health issues already existing in this area? This chemical is listed as a carcinogen.”

**Ohio EPA Response:** Ohio EPA is not aware of any such studies by the Ohio Department of Health. 1,4 dioxane has been found to be carcinogenic in rats and guinea-pigs. The carcinogenic properties of this chemical have been taken into account in the 35 ug/l cleanup requirement for this aquifer. This concentration equates to a risk of one additional cancer case in population of 100,000 people.

- 25. Written Comment:** “Have all avenues been explored in assurance this is the safest and

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most efficient process of eliminating this problem or is it just the most cost effective for the corporation?"

**Ohio EPA Response:** See Ohio EPA response to Comment No. 8 above.

- 26. Written Comment:** "What effect will this have on future development in Pickaway County as well as the counties south of Circleville. In The Circleville Herald today (February 17, 2004), an article appeared stating a developer refused to build a senior community in this area due to concerns of existing surface flooding with minimal precipitation."

**Ohio EPA Response:** In the long term, clean up of this ground water aquifer should be an economic benefit to Circleville and Pickaway County.

- 27. Written Comment:** "We feel if this problem is not resolved properly this may result in a lack of future development and cause depreciation of existing property values. Is there an alternative plan to resolve this problem?"

**Ohio EPA Response:** As discussed above in Ohio EPA's response to comment #8, several alternatives were evaluated prior to remedy selection.

- 28. Written Comment:** "According to an article in The Circleville Herald, February 12, 2004, the Earnhart Water District reported pumping from the aquifer will improve the quality of the water in aquifer. Is this a supposition without any supportive facts?"

**Ohio EPA Response:** The purpose of the ground water extraction wells is to remove 1,4 dioxane from the aquifer until it is reduced to an acceptable concentration. Therefore, yes, this work will improve the quality of the water in the aquifer.

- 29. Written Comment:** "Since the existence of this contaminate has been a problem for many years, without many of the area residents knowledge of these conditions, why is it suddenly necessary to address the problems without properly educating the area population."

**Ohio EPA Response:** The proposed discharge is a result of PPG continuing to implementing a previously approved method of remediating ground water contaminated with 1,4 dioxane. The approval of the final method in June of 2000, included a public comment period held through December 6, 1999, along with public information session

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and a public hearing held on October 25, 1999 at the Circleville City Hall. Based on the levels of contamination and the water quality standards, the method of extracting groundwater and pumping to the Scioto River was determined to be the most effective method available.

- 30. Written Comment:** "ARCE Systems, Inc. states "Dioxane exists as a liquid at room temperature, is fully miscible in water, and is expected to be highly mobile in soil. Soil contaminated with dioxane is expected to leach the contaminant into ground water. The compound is resistant to biodegradation, and therefore is not expected to biodegrade rapidly in the environment." PPG stated their goal is to resolve this problem in an eight year period. Is this possible?"

**Ohio EPA Response:** The physical and chemical properties of 1,4 dioxane, as cited in the above comment, contributed to remedy selection at Circleville. Its high solubility in water contributed to its movement in ground water down gradient of PPG. Its resistance to biodegradation contributed to the rejection of biological treatment when this alternative was evaluated in the feasibility study. Its high solubility supports the option of flushing the chemical from the aquifer to safe concentrations, using extraction wells. Ohio EPA will monitor the progress of achieving the desired reduction of the concentrations in the ground water plume. It is possible that the cleanup may be completed in less than eight years or longer than eight years. However, the eight-year time should be considered an approximation based on a computer ground water model of the aquifer developed by PPG's consulting engineer.