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TECH NOTES

VITRIFIED CLAY PIPE AND POLYVINYL CHLORIDE PIPE

An Environmental Comparison of Two Sanitary Sewer Pipe Materials

What is an Environmentally Preferable Product?

In 1993, Section 503 of Presidential Executive order 12873, titled "Federal Acquisition, Recycling and Waste Prevention" required EPA to ". ...issue guidance that recommends principles that executive agencies should use in making determinations for the preference and purchase of environmentally preferable products." The term **environmentally preferable** is defined in the Order to mean "...products or services that have a lesser or reduced effect on human health and the environment when compared with competing products-or services that serve the same purpose."

CLAY PIPE	PVC PIPE
Clay Pipe is an Environmentally Preferable Product Since most phases of its life cycle from production through disposal have relatively little environmental impact, clay pipe is considered one of the most environmentally acceptable of sewer pipe materials,	**PVC Pipe is Not as Environmentally Compatible as Clay Pipe** After extensive scientific research and peer review, the International Joint Commission(IJC) has called for a ban on the production and use of chlorine and chlorinated compounds.*1* This would include PVC pipe.
Clay Pipe is Energy Efficient It takes less energy to make clay pipe than PVC pipe. A study by the Illinois Institute of Technology shows that it requires 77,000 Btus to produce one foot of 8 inch clay pipe. *2*	**PVC Pipe is Not as Energy Efficient as Clay Pipe** IJNI-BELL, the PVC Pipe Trade Association, reported that it requires 144,000 Btus to produce one foot of 8 inch PVC sewer pipe.
Clay Pipe is Produced from an Abundant Resource Clay for the manufacture of clay pipe is available in virtually unlimited quantities within the continental U.S.	**PVC Pipe Raw Materials are Not Abundant** The petroleum-based materials used in the production of vinyl chloride monomer are derived from a non-renewable resource, much of which is imported from overseas.
Clay Pipe is Recyclable Clay pipe is recycled to make new pipe, brick and roofing tile. It is also used for road base, landscaping, running tracks and baseball	**PVC Pipe Recycling has been Rejected** In comments to USEPA, UNI-BELL asserted that the "industry is opposed to plastic pipes inclusion in the Comprehensive Procurement Guidelines

diamonds.	(CPG) and subsequent Recovered Materials Advisory Notice (RMAN) at this time for any of the listed uses."*3*
Clay Pipe is Cost-Effective When clay pipe is compared with PVC pipe using least cost analysis and generally accepted principles of engineering economics, clay pipe is usually the more cost-effective material,	**PVC Pipe is Not Cost-Effective in the Long Term** When costs for proper installation are added to the pipe cost and the shorter life expectancy is factored in, the life cycle cost of the installed line may not be as low as it appears from a comparison of pipe costs alone.
Clay Pipe Lasts for 100 + Years With over a half million miles of clay pipe still functioning in the U.S., many cities are exceeding the 100 year old clay pipe mark.	**PVC Pipe Has an Uncertain Life Expectancy** Different compounding ingredients, filler levels and installation inadequacies produce variable levels of field performance.
Clay Pipe is Non-Combustible The pipe is vitrified at about 2000 degrees F., effectively eliminating any combustible material.	**PVC Pipe is Combustible** PVC pipe bums, generating toxic fumes.

ALSO – CONSIDER THIS

The American Public Health Association has noted "...virtually all chlorinated organic compounds that have been studied exhibit at least one of a wide range of serious toxic effects such as endocrine dysfunction, developmental impairment, birth defects, reproductive dysfunction and infertility *4* , immunosuppression, and cancer, often at extremely low doses... "*5*

In March of 1996, the **Third Citizen's Conference on Dioxin** was held in Baton Rouge, Louisiana. In a series of Resolutions, the Conference called for, among other demands, "An immediate commencement of a phase-out of the industrial production and use of chlorinated organic compounds (...including...PVC)." In the preamble to these Resolutions, the Conference included the following paraphrasing from USEPA's

1994 Reassessment of certain Dioxin effects:

> "Dioxin is likely to cause cancer in (some) humans;
>
> Dioxin's non-cancer effects, including damage to the immune systems, endocrine system, development system and reproductive system may be even more serious than its cancer-causing effects..."*6*

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1. **Sixth and Seventh Biennial Report(s)** under the Great Lakes Water Quality Agreement of 1978 to the Governments of the United States-and Canada and the State and Provincial Governments of the Great Lakes Basin.

2. **Energy Audit of Vitrified Clay Pipe Fabrication** IITRI Report Project No. D8143, for National Clay Pipe Institute, August, 1979.

3. **(RCRA) Resource Conservation and Recovery Act** required publicationof the Guidelines and the-Notice.

4. Jacobsen JL; Jacobsen, SW; Humphrey HEB, Humphrey HEB, **Effects Of In Utero Exposure to Polychiorinated Biphenyls and Related Contaminants on Cognitive Functioning in Young Children**. The Journal of Pediatrics (1990) 116:38-45

5. Colburn T; Clement C, eds. **Chemically-Induced alterations in Sexual and Functional Development: The Wildlife/Human Connection.** Volume XXI of Advances in Modern Environmental Toxicology, Princeton Scientific Publishing Co., Inc. 1992

6. Excerpt from the **Resolution of the 3rd Citizens Conference on Dioxin**, March 17, 1996, Baton Rouge, Louisiana.

☐ **Scientific Highlights from the EPA Draft Reassessment**

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