



Division of Environmental Health

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Memorandum

To: NC Environmental Health Specialists

From: Steven Berkowitz, P.E., Engineering Team Leader, On-Site Wastewater Section

Subject: Alternative Pipe Materials for use in Septic Systems

Date: October 18, 2005

It has come to our attention that there is a serious shortage (meaning a major increase in price) of all types of PVC due to the lack of raw materials coming out of the Gulf. Prices have risen precipitously, and some local manufacturers have shut down because they can't get the raw resin. On the other hand, other large regional manufacturers we have contacted tell us they have plenty of pipe and material to sell. Still, we understand that some contractors are also investigating alternatives to PVC.

We have been asked about the acceptability of alternate pipe materials in different septic system applications. These are summarized below.

1. Pipe in septic system drainlines:

Standard: Corrugated Polyethylene (PE) Tubing and Fittings, complying with ASTM F 405 (which should be stamped on the pipe)

Alternates, per Rule .1955: Pipe satisfying Rule .1955 requirements for hole size and spacing with a stiffness equivalent to PE (minimum stiffness of 24 psi @ 5% deflection). Pipe should be stamped as compliant with an ASTM standard that requires the pipe to meet this equivalency requirement (e.g., ASTM D-3034). **Contact the OSWS for guidance in evaluating any proposed alternate material.**

Alternates, per Innovative Approval: A process has been established for alternative pipe which comply with applicable ASTM Standards to be pre-approved in Innovative Approval IWWS 2003-1 (see <http://www.deh.enr.state.nc.us/oww/Rulelaw/PipeSubsInnovAppr071304.pdf>). So far, ADS has obtained approval for an alternate pipe material under this Innovative Approval, but others could likewise apply for inclusion.

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2. Gravity pipe between septic tank and drainfield:

Standard: Schedule 40 PVC, PE or ABS or equivalent, or non-perforated PE if all of the installation requirements of Rule .1955(e) are met

Alternates: Use of gravity or pressure-rated sewer pipe other than Sch. 40 PVC is considered acceptable between the distribution device and the drainfield if it has a stiffness equivalent to corrugated PE (at least 24 psi) and is installed in accordance with Rule .1955(e). For example, PVC SDR 21, and SDR 26 (pressure rated at 160 psi or greater) labeled as compliant with ASTM D-2241 or PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D-3034 meet this requirement. Contact the OSWS for guidance in evaluating other proposed alternate materials for this application.

3. Pressure pipe between pump tank and drainfield:

Standard: Schedule 40 PVC, or equivalent, pressure rated pipe

Alternate: For supply line, from outside of the pump tank to the beginning of the drainfield, pressure-rated pipe (minimum pressure rating of 100 psi) constructed of PVC, PE, or equal may be used that complies with applicable ASTM standards (e.g., ASTM D-2241 for pressure-rated PVC, ASTM D-2239 or D-2737 for pressure-rated PE) **when designed by a Professional Engineer and certified by the design engineer** to be installed per ASTM D-2774 for Underground Installation of Thermoplastic Pressure Piping. Installation testing should include a hydrostatic pressure test similar to pressure-testing required for water mains, and comply with Rule .1955(o)(4).

Note: When alternative materials to PVC are used, it shall still be necessary to have approved, pressure-rated interconnections made between the non-Sch. 40 supply line and the PVC pump discharge piping and supply manifold piping such as required in an LPP or drip system (all of these still required to be of Sch. 40 PVC, or stronger). For example, for PE tubing, PVC-to-PE internal insert fittings and external compression fittings are available for making these pressure-rated connections. Sections of PE pipe make connected together by use of fusion welding or similar insert or compression fitting. Installers must strictly adhere to manufacturers' recommendations to assure proper, leak-proof connections. The integrity of all interconnections should be verified during the hydrostatic pressure test prior to backfilling.

Please feel free to contact our office if you have any questions pertaining to this Memorandum or related topics.