



## **ADVICE ON FLOOD PREVENTION AND MANAGEMENT**

### **Pennsylvania's Geography and Meteorology**

Pennsylvania has 86,000 miles of streams and rivers, second only to Alaska. Statewide average rainfall is 42 inches per year, partially due to its mountainous terrain. These factors combine to create the potential for flooding nearly anywhere in the state, any time of year. Two storms in September 2011 dropped an unprecedented amount of rain on the state.

### **Flood Recovery**

Following a flood, the removal of flood debris such as trees, logs, brush, rubbish or similar material from a stream channel does not need a permit or pre-approval from the Department of Environmental Protection (DEP) as long as the work is accomplished from the stream bank. Owners of bridges and culverts do not need DEP's authorization to clean debris.

Verbal or written approval is required to remove gravel within 50 feet upstream and downstream of the structures. Silt and debris removal should be done in accordance with the Standards for Channel Cleaning at Bridges and Culverts.

During the storms of September 2011, DEP issued 330 emergency permits for work on streams, bridges, culverts and other infrastructure. Work performed under these permits included bank stabilization and removal of accumulated silt and sediment from stream channels. Debris removed from streams, which included wood, propane tanks, portions of manufactured homes and trailers, among other things, piled up against bridge piers and trees.

### **Stream Restoration vs. Dredging**

DEP promotes stream restoration projects in lieu of stream dredging activities. A common misconception is that removing recently deposited gravel from a stream channel creates additional capacity for water to flow during storm or flooding events. Another common misconception is that dredging a channel or stream deeper and wider than it was prior to the last flooding event will create even more capacity for water to flow during storm or flooding events. Poorly devised, randomly executed or under-engineered dredging, deepening or widening of streams has proven to be ineffective in preventing subsequent flooding. All streams transport sediment during storm events and under-engineered dredging, deepening or widening of streams reduces the stream's capacity to effectively transport normal sediment loads. This leads to rapid sediment deposition in the channel, as well as channel instability, increased stream bank erosion and damage to aquatic environments.

### **When is a Permit Needed?**

Depending on the scope of the project, applicants may need to apply for a general permit for gravel removal (GP-3) or a Chapter 105 dam safety and waterway management permit. Carefully planned and appropriately engineered stream restoration projects can improve a stream channel's ability to transport sediment and maintain its natural capacity. This should improve a stream's performance during a flooding event and maintain existing aquatic environments. DEP's stream improvement program restores flood-damaged streams, stabilizes stream banks affected by erosion and reduces the risk of flooding. DEP has implemented more than 1,000 stream improvement projects since the program began in 1947. During periods of emergency, the potential exists to be placed on a waiting list.

### **Flood Protection**

Pennsylvania has one of the most extensive flood protection programs in the nation. DEP plans, designs, constructs and inspects flood control projects that are designed to provide protection for a 100-year flood. Accounting for inflation, the state has invested over \$800 million in more than 200 flood control projects statewide. DEP responds to requests from flood-prone communities by determining the

work needed to address each community's problems. Measures to address a given community's problems may include one or more of the following: compacted earth levees, concrete lined channels, upstream reservoirs, and channel and floodplain improvements.

Economic justification for the work is determined by a feasibility study, which weighs the costs of the project against the anticipated reduced risk of flood damage. Benefits must equal or exceed costs. DEP engineers conduct a feasibility study, analyzing hydrologic and hydraulic issues, flood damage, alternative protection measures, costs and historical and environmental impacts.

### **Local Government Involvement**

Local governments serve as sponsors for projects in their communities. Sponsorship may involve: acquiring rights-of-ways and easements; holding the commonwealth free of liability; maintaining and operating the completed project after construction; providing borrow and spoil areas; altering or rebuilding inadequate bridges; and relocating or removing buildings or utilities that would interfere with the project. Through Act 167, county and local governments can become more proactive in managing the quantity and quality of the storm water, along with the land use within their jurisdiction.

### **Questions?**

For information about the handling and disposal of flood debris, contact the nearest DEP office:

<b>Southeast Region: Norristown</b>	484-250-5900	<b>Northeast Region: Wilkes-Barre</b>	570-826-2340
<b>South-central Region: Harrisburg</b>	717-705-4700	<b>North-central Region: Williamsport</b>	570-327-3636
<b>Southwest Region: Pittsburgh</b>	412-442-4000	<b>Northwest Region: Meadville</b>	814-332-6945

For more information, visit [www.dep.state.pa.us](http://www.dep.state.pa.us), keyword: DEP Flood Recovery.