Appendix G—Stream Crossings and Access Roads

A. Stream Crossings

Mankind has chosen to change the environment rather than changing his living patterns to adapt to the environment. One of these changes to the environment is the installation of bridges, culverts, and other stream crossings. If properly designed, constructed and maintained, these crossings do not cause a problem. Even properly designed and constructed stream crossings can become inadequate because of:

(1) Upstream development that increases the stormwater runoff entering the crossing,
(2) Sedimentation, debris accumulation, or other blockages that reduce their hydraulic efficiency.

Inadequate stream crossings restrict the flow of water and create greater flooding in upstream areas. No development activities including stream crossings or fills are allowed within the floodway if they would cause a cumulative increase in the base flood elevation of one foot or more. As a general rule of thumb, the WV Department of Transportation has established the following guidelines for stream crossings. They will generally be adequate if they are installed and maintained so that they will function properly up to these specified events:

- A 50-year storm event, affecting expressway and trunk-line highways
- A 25-year storm event, affecting other highways (*over* 200 ADT)
- A 10-year storm event, affecting other highways (*under* 200 ADT)

Exceptions to these frequencies may occur when stream records show higher discharges, if the existing highways floods more frequently than the general guidance, or when potential property damage and injuries justify the use of less frequent storm events. This applies to flooding of the roads themselves. Like any other activity, highways are not allowed to cause a cumulative increase of one foot or greater in the base flood elevation. Figure G-1 shows a properly designed and constructed stream crossing.

The Division of Highways may require anyone placing culverts or bridges or accessing a public highway to build a stormwater storage facility to ensure that there is no net increase in peak water runoff from the facility. These requirements are usually restricted to major commercial development and residential subdivisions.

Figure G-1. A properly designed and installed culvert

The Clean Water Act mandates that culverts cannot be barriers to aquatic life. Aquatic life includes fishes, mussels, crustaceans and benthic organisms (insect larvae).The culverts must be adequate in size and shape to maintain low flow conditions. The culverts should be oversized with the lowest edge of the culvert installed at or below the normal water surface so that the aquatic life listed above can travel up and down stream through them. Figure G-1 shows a properly installed culvert that does not restrict passage of aquatic species.

Individuals usually determine the size of private stream crossings based on availability, price, or ease of installation. Local jurisdictions may not have the technical expertise to ensure that culverts are properly designed, constructed and maintained. The Task Force recommends that voluntary guidelines or Best Management Practices (BMP) for the sizing, installation, and maintenance of culverts, drainage structures and stream/river crossings be developed by the Task Force. Municipalities and private individuals installing stream crossings should use one with a diameter or cross section at least as large as the closest appropriate downstream Division of Highways crossing or the crossing should be sized by a WV registered professional engineer.

In addition, guidelines or BMPs for installation and maintenance of stream crossings for the 10-year storm event without causing additional upstream flooding should be developed and enforced. Appropriate sizing for culverts and bridge openings must

consider the potential for future development in the watershed. Where such development potential exists, culverts and bridge cross sections should be enlarged to handle anticipated runoff. A program, including a permitting process, should be established within a State agency to control the design, installation, and maintenance of private and public non-highway drainage structures.

Currently the Division of Natural Resources, Public Lands Corporation signs contracts with individuals conducting in-stream construction or channel alteration. While these documents are called "permits", they are simple contracts and there is no penalty for failure to comply with the terms of them. The Task Force recommends that the WV Public Land Corporation, through legislative enactment and increased staffing, be enabled to enforce current requirements for instream construction or channel alteration.

In addition, the Task Force recommends that the WV Public Land Corporation be provided the staff and resources to develop and enforce a legal contract requiring permit applicants to agree to maintain a specified minimum hydraulic carrying capacity of the structure being installed. Unlike Department of Highway crossings, municipal and private crossings are not always well maintained. They become filled with sediment or blocked by debris and can not transport the quantity of water necessary. The owner can remove debris from private culverts under provisions of the Army Corps of Engineers nationwide permit (NWP) Number 3. These maintenance activities should be conducted during daylight hours and after consultation with the appropriate District of the Corps of Engineers, Water Resources Inspectors of the WV Department of Environmental Protection, and the WV Public Land Corporation. (See Table G-1). While there is no mandate to notify the last two agencies mentioned, it is a good practice to do so.

Future upstream development is seldom taken into consideration when determining the size of stream crossings. Converting a lawn, forest or vegetated area into a gravel parking lot triples the stormwater runoff. Converting a vegetated area into a shopping mall or other paved, roofed or impervious surface creates more than four times the amount of stormwater runoff. Until future watershed development is taken into consideration during the design of stream crossings, West Virginia will continue to be plagued by inadequately sized and poorly maintained stream crossings.

In addition to stream crossings that are used on a regular basis a number of stream crossings have been abandoned by the original users. Some abandoned railroads and roads have left the culverts, bridges, and trestles, or the piers that supported the bridges and trestles, in place. These crossings are no longer maintained or serviced. Frequently these structures, like actively used structures, catch floatable debris and form temporary dams that increase flooding and property damage. Figure G-2 shows an abandoned crossing blocking debris after a major flood event.

The Task Force recommends that funds be provided to the WV Division of Highways from the general fund for a study of abandoned stream crossings (public or private road or railroad bridges or culverts) to ascertain ownership of said facilities, and

provide recommendations for condemnation and removal if deemed necessary to reduce flood damages.

Figure G-2. Abandoned crossing acting as a debris dam after a major flood event

There may be other requirements and restrictions for stream crossings in certain waters. These include streams that may contain endangered and threatened species, wetlands, Wild and Scenic Rivers, Natural Stream Preservation Act streams, streams in the National Forest or National Recreation Area, and many others. It is imperative that any agency or individual working in a stream contact the U. S. Army Corps of Engineers prior to doing any work in the stream. Table G-1 shows a list of the agencies that should be notified for debris removal and disposal.

The Task Force recommends that the State create a technical assistance program that includes funding and resources for a State agency to provide assistance in the design, installation, and maintenance of public and private stream crossings. The WV Division of Highways may be the appropriate State agency for this program given their extensive experience in stream crossing design and construction. The program could be deployed through the various Highway District offices.

The Task Force recommends that procedures be established to provide local government with technical advice and review services prior to issuing permits for development in the floodplain and for private stream crossings. A State funding source to reimburse the State agency providing assistance for costs associated with this activity should also be established.

WV Department of Environmental Protection	
	Division of Water and Waste Management 1201 Greenbrier Street Charleston, WV 25311-1088 (304) 558-2107
	Division of Waste Management 1356 Hansford Street Charleston, WV 25301 (304) 558-5929
	Environmental Enforcement 1356 Hansford Street Charleston, WV 25301 (304) 558-2497
	Environmental Enforcement—Southwest Regional Office General Delivery Putnam Village #18 Teays, WV 25569 Phone: (304) 757-1693 Fax: (304) 757-3873
	Environmental Enforcement—Southeast Regional Office 116 Industrial Drive Oak Hill, WV 25801-8329 Telephone: (304) 465-1919 Fax: (304) 465-1524
WV Division of Natural Resources	
	Public Lands Corporation Building 3, Room 669 1900 Kanawha Boulevard, East Charleston, WV 25305-0660 (304) 558-3225
U S Army Corps of Engineers – Huntington District	
	Huntington District Regulatory Office 502 Eighth Street Huntington, WV 25701 (304) 529-5710

Table G-1

Contact Information for Debris Removal and Disposal

B. ACCESS ROADS

Access roads are constructed by a multitude of industries in West Virginia. There are logging roads, skid roads, mining roads, haul roads, prospecting roads, roads to oil and gas wells, landfill access roads, roads into and across farms, pipe or power line access roads, construction access roads, recreational roads or jeep trails used for sight seeing and all terrain vehicle pleasure riding.

Regardless of their purpose, all of these roads have one thing in common. They will, unless properly designed and constructed to reduce runoff and sedimentation, act as direct conduits of stormwater runoff and sedimentation to the streams. Figure G-3 shows a steep access road that will serve as a runoff conduit during rainfall events.

Figure G-3. Steep Access Road at Timber harvesting Operation,

For the purposes of this report, access roads are narrow unpaved trails or roads that are infrequently or temporarily used and are not constructed or maintained by a government agency as part of the public highway system. Access roads may have a dirt or gravel surface, and may be of any width.

After the 2001 floods in southern West Virginia, the Governor appointed a Flood Investigative Advisory Committee to examine the effects of mining and timber harvesting on flooding. This committee and a subordinate work group, the Flood Advisory Technical Team (FATT) issued a report which included recommendations for access roads. Although the FATT report only concerned mining and timber harvesting in a few watersheds, the portions of their report that addressed access roads is pertinent to all industries that construct, maintain or use access roads.

The Task Force recommends that regulations and/or best management practices including minimum criteria for construction and closure or abandonment of access roads be developed and applied consistently to all industries throughout West Virginia. Numerous agencies have regulations or BMPs that address access roads, but these are not uniform.