



## **Erosion and Sediment Control Best Management Practices For Water Well Drilling and Aquifer Testing**

This fact sheet describes Best Management Practices that should be used in developing and implementing erosion and sediment (E&S) control plans at water well drilling and aquifer testing sites. Because site conditions vary greatly, it is recommended that all well drilling contractors meet with county conservation district staff prior to beginning the work to discuss site constraints and the most appropriate plan.

### **Erosion and Sediment Control Measures for Residential Wells and Other Low Capacity Wells**

The installation of most residential wells typically involves the generation of **up to 25 gallons per minute (gpm)** including both the drilling operation and the pumping operation. The recommended E&S control measures to address the low flows leaving the well casing involve limited detention and then discharge from the well area overland through vegetated terrain.

Detention time should be provided to cause the well cuttings and solids to drop out of the flow. For wells being drilled at construction sites, this can be accomplished by excavating a shallow trench, 10 to 15 feet long, immediately downgrade of the well. The downstream edge of the trench should be level to allow water to spill out uniformly over the entire length of the trench. A semi-circle of silt fence or straw bales should be installed downgrade of the trench for further sediment removal. Refer to Tables 17 and 18 of the *Erosion and Sediment Pollution Control Manual* DEP ID: 363-2134-008 (E&S Manual) on DEP's Web site at [www.depweb.state.pa.us](http://www.depweb.state.pa.us), keyword: Source Water and Groundwater Protection.

From the trench, overland flow should be directed as sheet flow across a thickly vegetated area. This vegetated filter must conform to slope requirements discussed for vegetative filter strips in the E&S Manual. As indicated, a minimum of 50 feet of vegetated terrain must be available between the trench and the nearest down slope water conveyance. If adequate vegetation is not available downgrade of the well site, or if the minimum distance to water conveyance is less than 50 feet, E&S measures for medium and high capacity wells described below should be employed. These more rigorous E&S measures for medium and high capacity wells should also be used for all residential or small sized wells drilled within 200 feet of high quality and exceptional value waters as defined in Pa. Code Chapter 93.

For wells being installed in established, landscaped areas, minimal site disturbance is desirable. An alternative to the trench described above is to use a device on the well casing to divert drillings to a tank truck or a container which can be hauled from the site for disposal.

### **Erosion and Sediment Control Measures for Medium and High Capacity Wells**

More rigorous E&S measures are recommended for medium and high capacity wells with anticipated flows **exceeding 25 gpm**. Most larger private wells and public water supply wells will exceed these low flows.

The recommended E&S measures to address the medium to high flows leaving the well casing involve detention in an excavated sump and pumping the settled water through a filter bag.

Adequate detention time can be provided by directing well casing overflow to an excavated sump sized so that the volume of the sump in cubic feet is equal to the flow in gallons per minute. Settled water from the sump is pumped to an appropriately sized filter bag. According to manufacturer's recommendations, the filter bag should be placed on a stabilized area of dense vegetation as shown in Standard Construction Detail #26 (E&S Manual). If the vegetative cover is not available, the filter bag should be placed on a bed of gravel.

### **Erosion and Sediment Control Measures for Aquifer Testing**

Flows exceeding 500 gpm are possible during aquifer testing of some water supply wells. The clarity of the test flows may vary from very muddy in a limestone aquifer where clay is present, to quite clear in a sandstone aquifer. Measures must be taken to prevent sediment pollution from aquifer tests with turbid water. Precautions are also needed to allow high flows of clear water to discharge from the site without causing accelerated erosion of the landscape.

Muddy water yielded by aquifer testing should be allowed to settle and then pumped through a filter bag as described above in E&S Control Measures for Medium and High Capacity Wells. Considering that these flows can be very high, the contractor must utilize large enough filter bags or construct a manifold system using several

smaller bags at one time. Care should also be taken to replace the bags promptly when full or when they fail due to a tear in the material.

In a situation where the actual well yields exceed anticipated flows by a considerable amount and the erosion and sediment control measures are inadequately sized, and waterways are threatened with sediment pollution, the operation must be shut down until more appropriate E&S controls are provided. It is recommended that the county conservation district or DEP Regional Office be contacted to assist in developing the appropriate E&S controls.

Clear water flows generated during well yield pumping should be discharged to a watercourse by way of a diversion channel or conduit. The project's E&S plan should provide details on proposed means of transporting the clear water. A typical cross section and design considerations for a clear water diversion channel are provided in Standard Worksheet #22 in the E&S Manual. The channel lining must be designed appropriately for the anticipated velocity. In a similar manner, if a conduit is proposed, supporting hydraulic design information should be provided.

Adequate protection against erosion should be placed at the downstream end of the clear water diversion channel or conduit. A General Permit No. 3 may be required for the protection and a General Permit No. 4 may be required for the outfall, depending on the drainage area of the receiving stream at the discharge point.

It is important to remember that when considering the most appropriate means of controlling erosion and sediment at well sites, recirculating the discharge water into the aquifer will invalidate the aquifer test. Therefore, care must be taken in designing and locating the E&S control measures so that the aquifer test does not induce artificial recharge from discharged well water.

### Summary

The preceding E&S measures are considered acceptable Best Management Practices for well drilling sites. However, site constraints may require that other measures be taken to prevent erosion and sediment pollution. Alternatives to these measures can be developed and agreed upon by the well driller and the conservation district where appropriate.

For more information, visit [www.depweb.state.pa.us](http://www.depweb.state.pa.us), keyword: Source Water and Groundwater Protection.

For more information, call the county conservation district or the DEP regional office in your area or contact:

**Department of Environmental Protection  
Bureau of Watershed Management  
P.O. Box 8555  
Harrisburg, PA 17105-8555  
717-787-9633**

**Department of Environmental Protection  
Bureau of Water Standards and Facility Regulation  
P.O. Box 8774  
Harrisburg, PA 17105-8774  
717-787-8184**

#### **Southeast Region**

2 E. Main St.  
Norristown, PA 19401  
Main Telephone: 484-250-5900  
24-Hour Emergency: 484-250-5900

**Counties:** Bucks, Chester, Delaware, Montgomery and Philadelphia

#### **Southwest Region**

400 Waterfront Drive  
Pittsburgh, PA 15222-4745  
Main Telephone: 412-442-4000  
24-Hour Emergency: 412-442-4000

**Counties:** Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland

#### **Southcentral Region**

909 Elmerton Ave.  
Harrisburg, PA 17110  
Main Telephone: 717-705-4700  
24-Hour Emergency: 1-877-333-1904

**Counties:** Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York

#### **Northwest Region**

230 Chestnut St.  
Meadville, PA 16335-3481  
Main Telephone: 814-332-6945  
24-Hour Emergency: 1-800-373-3398

**Counties:** Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren

#### **Northeast Region**

2 Public Square  
Wilkes-Barre, PA 18711-0790  
Main Telephone: 570-826-2511  
24-Hour Emergency: 570-826-2511

**Counties:** Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming

#### **Northcentral Region**

208 W. Third St., Suite 101  
Williamsport, PA 17701  
Main Telephone: 570-327-3636  
24-Hour Emergency: 570-327-3636

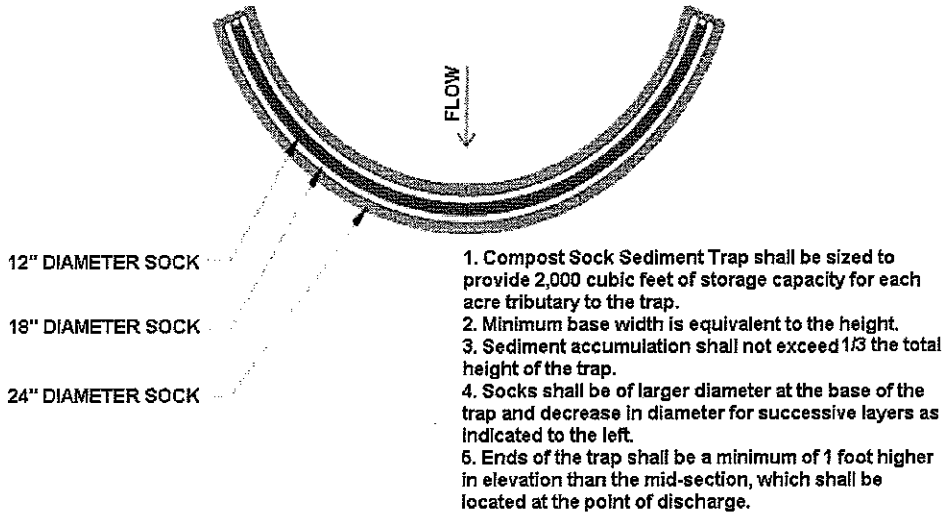
**Counties:** Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union



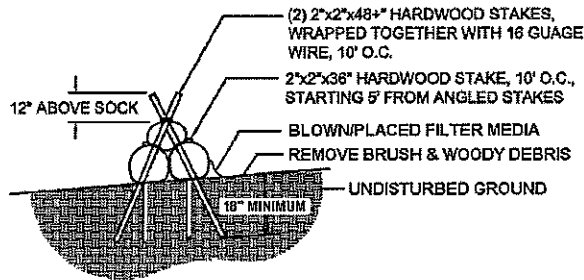
**COMPOST SOCK SEDIMENT TRAP - Sediment Removal Efficiency: HIGH. This device is an ABACT for HQ and EV watersheds.** In many locations, there is little or no opportunity to direct runoff from an access road into a well-vegetated area. This may occur at entrances or where surface waters are in relatively close proximity to the access road. At such locations it may still be possible to treat the runoff by means of a compost filter sock. These structures can be installed, used and later removed with relatively little disturbance to the area. In fact, the compost within the sock

can be used during cleanup as a soil stabilizer or vegetative growth medium. Runoff may be directed into the trap using any of the devices described above. Compost filter socks are addressed in this chapter to emphasize their usefulness in controlling runoff from access roads. However these devices may be used at most locations where a temporary sediment trap is appropriate. The trap should be constructed according to Standard Construction Detail # 3-11. Sock material should meet the minimum standards provided in Table 4.1.

**STANDARD CONSTRUCTION DETAIL #3-11  
Compost Sock Sediment Trap**



**PLAN VIEW**



Adapted from Filtrexx  
**STAKING DETAIL**

**Sock Material shall meet the standards of Table 4.1. Compost shall meet the following standards:**

<b>Organic Matter Content</b>	<b>80% - 100% (dry weight basis)</b>
<b>Organic Portion</b>	<b>Fibrous and elongated</b>
<b>pH</b>	<b>5.5 - 8.0</b>
<b>Moisture Content</b>	<b>35% - 55%</b>
<b>Particle Size</b>	<b>98% pass through 1" screen</b>
<b>Soluble Salt Concentration</b>	<b>5.0 dS Maximum</b>

Compost Sock Traps shall not exceed three socks in height and shall be stacked in pyramidal form as shown above. Minimum trap height is one 24" diameter sock. Additional storage may be provided by means of an excavated sump 12" deep extending 1 to 3 feet upslope of the socks.

Compost Sock Traps shall provide 2,000 cubic feet storage capacity with 12" freeboard for each tributary drainage area.

The maximum tributary drainage area is 5.0 acres. Since compost socks are "flow-through", no spillway is required.

Compost sock traps shall be inspected weekly and after each runoff event. Sediment shall be removed when it reaches 1/3 the height of the socks.

Photodegradable and biodegradable socks shall not be used for more than 1 year.