

Wayne Conservation District

EROSION CONTROL GUIDELINES FOR SMALL PROJECTS

Introduction

In an attempt to alleviate the continuing problems of controlling sediment pollution, the Commonwealth of Pennsylvania, through the Department of Environmental Protection (DEP), adopted Chapter 102, Erosion Control Rules and Regulations. Chapter 102 requires that anyone undertaking an earth disturbance activity develop and implement an Erosion and Sedimentation (E&S) Control Plan. The plan must be submitted to the County Conservation District for review if required by the local municipality or if requested by the District. The E&S plan must be available at all times at the site of the earth disturbance activity, regardless of the size of the project. Failure to have an E&S plan on site is a violation of Chapter 102. It is important to remember that both landowners and contractors may be held responsible for any violation of the Chapter 102 Regulations.

Use of This Guide

This pamphlet may be used in the development of E&S plans for small projects where:

- Disturbance is less than one acre.
- There are no steep slopes in excess of 10%.
- There are no streams or major drainage courses.
- The landowner is submitting a Chapter 105 General Permit for acknowledgement.

Due to changes in the Commonwealth's NPDES permit program, projects disturbing one acre or more may need a NPDES permit. Contact your local Conservation District to determine if your project meets these requirements or if there are any questions regarding the suitability of this guide for your project. For larger, more complex projects, a detailed *Erosion and Sediment Pollution Control Manual* is available or contact a consultant to aid in plan development. In addition, check with your local municipality regarding specific ordinances or permit requirements.

Considerations in Plan Development

SAVE EXISTING VEGETATION - Vegetation cover is the best and most economical protection against soil erosion. Protect existing vegetation during the construction process. Trees and shrubs should be marked and roped off to protect them from damage by construction equipment. Filling and soil compaction around trees should be avoided.

SAVE TOPSOIL FOR REVEGETATING - All of the topsoil from areas where cuts and fills have been made should be stockpiled and re-distributed uniformly after grading. This is a key to re-vegetating a site.

MINIMIZE THE AREA AND TIME OF EXPOSURE - Disturb as little of the area as is required to construct the project. The construction sequence should be planned to keep the size and time of exposure to a minimum. In other words, stabilize disturbed areas as they are completed.

AVOID STEEP SLOPES - Steep sites generally will require more E&S controls than gently sloping sites. Avoid excessive cutting and filling and road grades in excess of 10%.

PROTECT DITCHES, STREAMS, OR OTHER BODIES OF WATER - Maintain vegetated buffers where possible. Install temporary controls, such as filter fabric fence, compost filter socks, or rock filters to keep sediment pollution out of streams and other water sources.

PLAN TO MAINTAIN EROSION CONTROL MEASURES - Compost filter socks and fabric filter fabric fences clog, and seeded areas wash out. Schedule regular maintenance to ensure properly functioning control measures. Continuous maintenance problems and failure of E&S facilities indicate a need to consider upgraded control measures.

What to Include in an Erosion & Sedimentation Control Plan

- The existing topography of the site – slope or grade of the land, location of any water (streams, ponds, wetlands, springs, etc.) and any other significant features of the site.
- Types of soils on the site – refer to County Soil Survey, available at Conservation District office.
- A description of the proposed alterations to the site.
- The staging of earth disturbance activities. Determine the sequence in which the earth disturbance will occur, always keeping in mind that the most effective method of controlling erosion is to disturb only those areas necessary for construction. Disturbed areas should be stabilized immediately after earth disturbance has been completed or earth disturbance activities cease.
- Types of control measures, both temporary (such as compost filter socks, filter fabric fences, stone filters, etc.) and permanent (such as seeding and mulching, rock-lined or geotextile-lined channels).
- A maintenance plan for all of the control measures being used.

Suggested Sequence of Earth Disturbance Activity

1. Install a tire cleaning, rock construction entrance (see detail).
2. Install temporary control measures such as compost filter socks, filter fabric fences, etc. (see detail).
3. Rough grade site and stockpile topsoil. Temporary protection (compost filter socks or filter fabric fence) should be installed down slope (lower side) of the stockpile and the stockpiles should be immediately stabilized with temporary seed (e.g., annual ryegrass).
4. Install and immediately stabilize any watercourses (swales, ditches, etc.) with appropriate lining (e.g., seed and mulch, matting or netting, sod or stone).
5. Construction building(s).
6. Finish grade and permanently stabilize (seed and mulch, sod, stone, etc) the site.

Seeding and Mulching Specifications

Time of Seeding – For best results, grass and legume seeding should be completed in the spring. Seedings that are primarily grass are best suited for fall planting. However, through proper seed selection and seeding methods, disturbed sites may be re-vegetated at almost any time from spring to fall. Check for recommended spring and fall seeding dates in your area.

Surface Preparation – Spread topsoil and prepare smooth seed bed by rolling and/or raking.

Lime and Fertilizer – Lime and fertilizer should be applied in accordance with soil test recommendations. If soil test results are not available, apply at least 6 tons of agricultural grade limestone and 1000 pounds of 10-20-20 fertilizer per acre.

Seeding Methods – Apply seed at required rates. If legumes are planted, be sure to inoculate the seed with the correct legume inoculant. Seed may be broadcast on the surface and a layer of mulch applied at the necessary rates. Hydroseeding is another method of seeding, where the seed, fertilizer, and mulch are mixed with water to form an emulsion. This method should only be done with the correct equipment or by professionals.

Mulching – All earth disturbance areas, regardless of seeding method, should be mulched to reduce erosion and aid seed germination. Hay or straw are the preferred mulches and should be applied to produce a layer $\frac{3}{4}$ to 1 inch deep. Generally, 3 tons of mulch per acre (approximately 3 bales per 100 sq.ft.) is sufficient.

For more information – Consult the *Penn State Agronomy Guide* or your local Extension Office.

SMALL PROJECT EROSION CONTROL PLAN

Property Owner: _____ Date: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Municipality: _____

Contact person (if other than property owner): _____

Location (include copy of topographic map): _____

Name of nearest receiving stream or body of water: _____

Estimated dates for start-up and completion: Start: _____ End: _____

Type of project (house, addition, store, etc.): _____

Project acres (entire property): _____ Disturbed acres: _____

Present site conditions (vegetative cover, existing disturbance, type of land use, etc.): _____

Soil type(s) (include Soil Map): _____

NARRATIVE (Give detailed description of proposed work.)

SEQUENCE OF CONSTRUCTION (Label each step in numerical order - be specific.)

TEMPORARY CONTROLS

Detail any temporary erosion control practices that will be implemented. List each control practice separately, explain why it is needed, and when it can safely be removed. Drawings and designs for any practice not illustrated in this guide should be attached and referenced in this section.

PERMANENT CONTROLS

Prior to completion of the project, state law requires that steps be taken to provide permanent stabilization. Re-establishment of vegetation, riprap, pavement, etc. are examples of permanent controls. Descriptions for re-vegetating should include the seeding mixture to be used, top soil applications, and lime and fertilizer instructions.

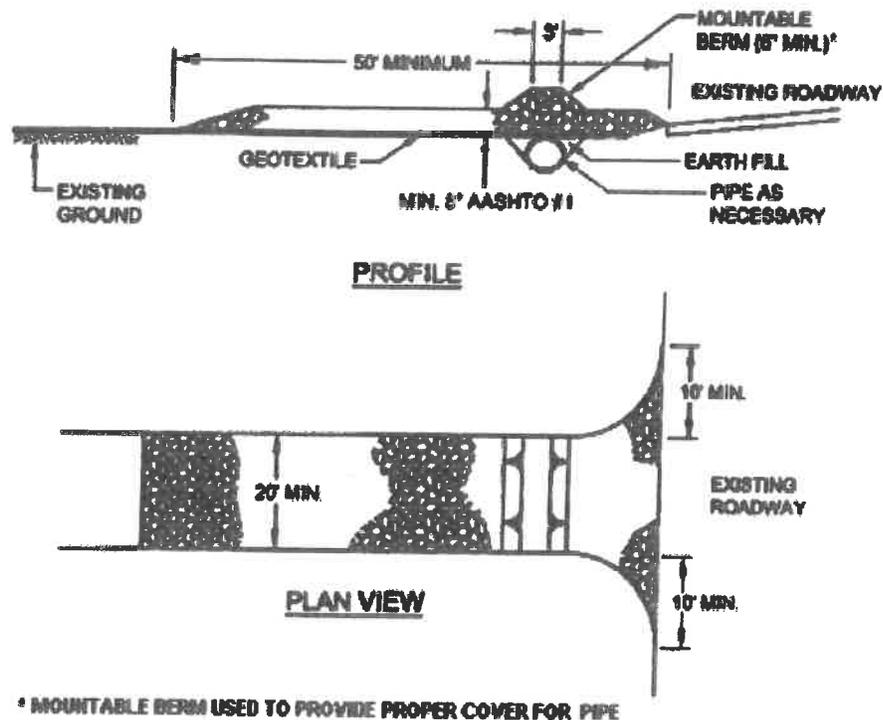
MAINTENANCE PROGRAM

All erosion control practices require maintenance to junction properly. Straw bale dikes deteriorate and clog with sediment. Newly seeded areas may fail to germinate or be washed out by heavy rain. Straw bale barriers and filter fabric fences should be cleaned when they are at half their capacity. Please describe efforts you will make to ensure that all erosion control practices will continue to function properly and specify who will be responsible for maintenance.

IMPORTANT

Keep a copy of this plan for your records and PROVIDE A COPY TO YOUR CONTRACTOR, if applicable. This plan must be on site at all times during earth disturbances.

Rock Construction Entrance



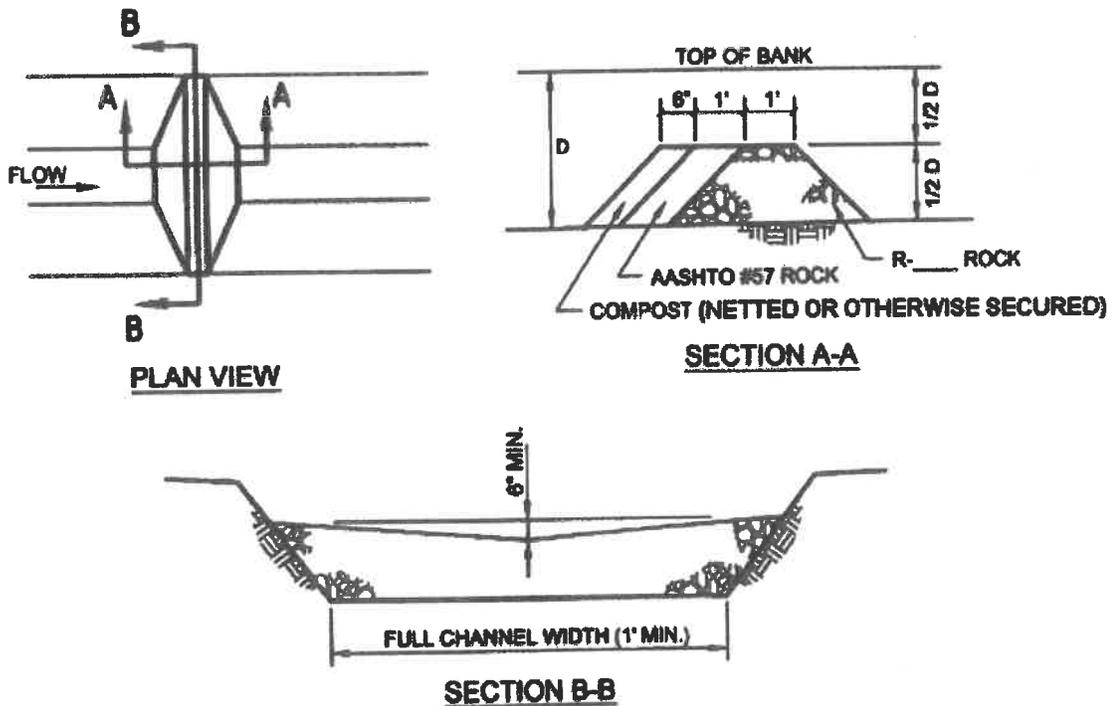
Remove topsoil prior to installation of rock construction entrance. Extend rock over full width of entrance.

Runoff shall be diverted from roadway to a suitable sediment removal BMP prior to entering rock construction entrance.

Mountable berm shall be installed wherever optional culvert pipe is used and proper pipe cover as specified by manufacturer is not otherwise provided. Pipe shall be sized appropriately for size of ditch being crossed.

MAINTENANCE: Rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile shall be maintained on site for this purpose. All sediment deposited on paved roadways shall be removed and returned to the construction site immediately. If excessive amounts of sediment are being deposited on roadway, extend length of rock construction entrance by 50 foot increments until condition is alleviated or install wash rack. Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.

Rock Filter



PA DEP

FOR $3' < D$ USE R-4
FOR $2' < D < 3'$ USE R-3
NOT APPLICABLE FOR $D < 2'$

Rock filters should be constructed with riprap sized as follows:

- For channels with total depth > 3 feet, use R-4.
- For channels with total depth between 2 and 3 feet, use R-3.

Rock filters should not be used in channels of less than 2 feet total depth.

The filter should be equal in height to half the total channel depth with a 6" depression in the center.

A one foot thick layer of AASHTO #57 (or smaller) stone should be placed on the upstream side of the filter. In special protection watersheds, a 6" layer of compost should be placed and anchored on top of the filter stone. NOTE: Filter fabric and straw bales should not be used in rock filters!

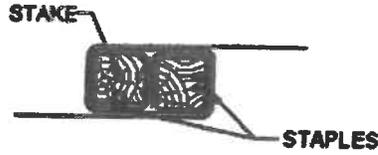
Rock filters should be inspected weekly and after each runoff event.

Clogged filter stone (AASHTO # 57) should be replaced.

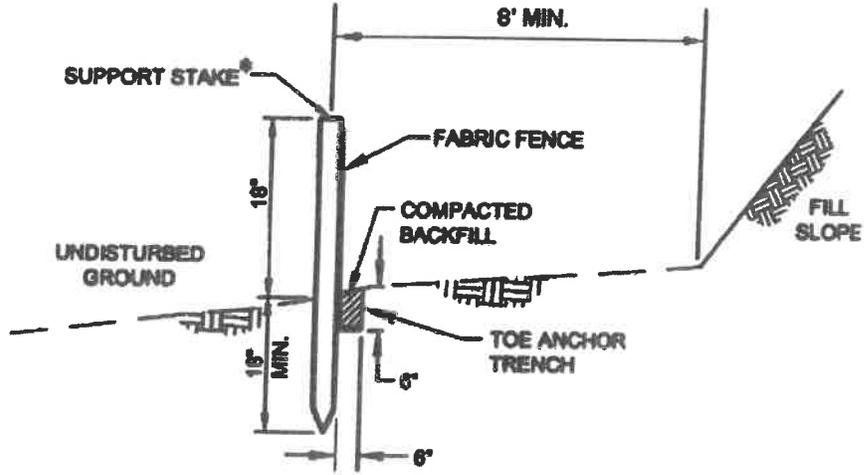
Sediment shall be removed when accumulations reach $1/2$ the height of the filter.

Standard Silt Fence (18" High)

*STAKES SPACED @ 8' MAX.
USE 2" x 2" (± 3/8") WOOD
OR EQUIVALENT STEEL
(U OR T) STAKES



JOINING FENCE SECTIONS



ELEVATION VIEW

PA DEP

Immediately upon stabilization of each channel, installer shall remove accumulated sediment, remove rock filter, and stabilize disturbed areas.

Fabric width shall be 30" minimum. Stakes shall be hardwood or equivalent steel (U or T) stakes.

Silt fence shall be placed at level existing grade. Both ends of the fence shall be extended at least 8 feet up slope at 45 degrees to the main fence alignment.

Sediment shall be removed when accumulations reach half the aboveground height of the fence.

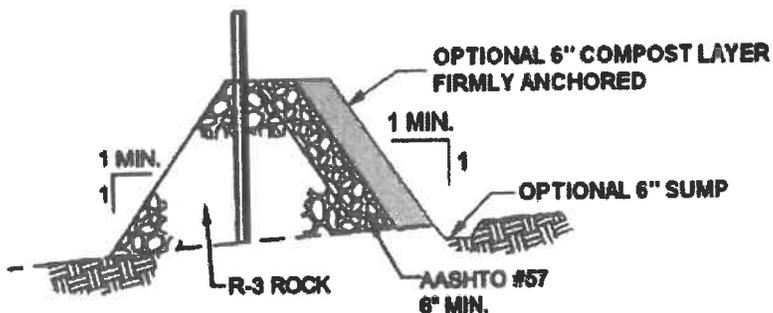
Any section of silt fence which has been undermined or topped shall be immediately replaced with a rock filter outlet.

Fence shall be removed and properly disposed of when tributary area is permanently stabilized.

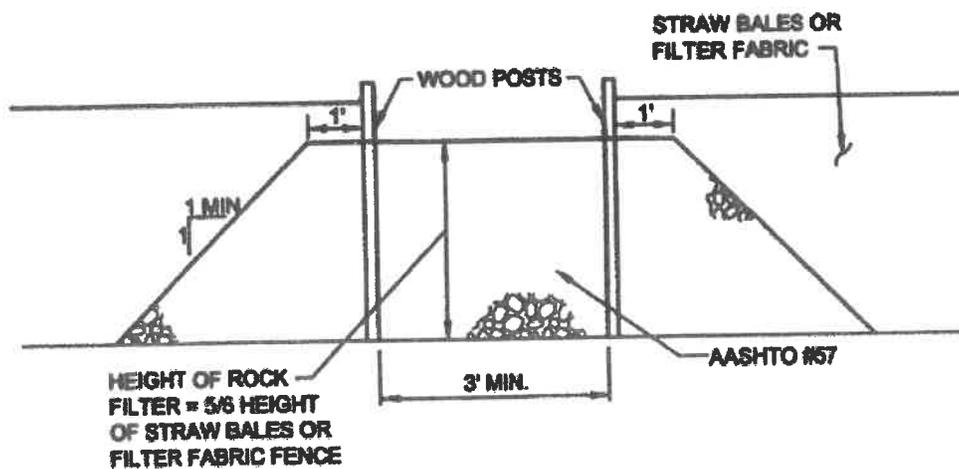
Maximum Slope Length for Silt Fence

Slope - Percent	Standard (18" High) Silt Fence	Reinforced (30" High) Silt Fence
2 (or less)	150	500
5	100	250
10	50	150
15	35	100
20	25	70
25	20	55

Rock Filter Outlet



OUTLET CROSS-SECTION

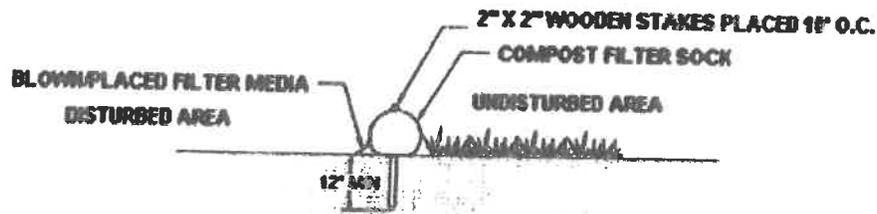


UP-SLOPE FACE

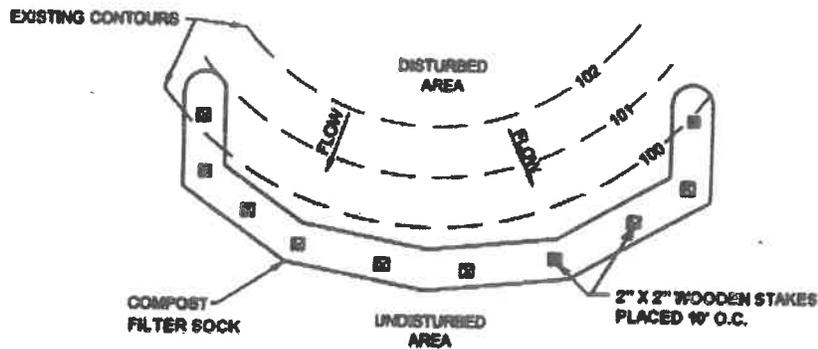
A rock filter outlet shall be installed where failure of a silt fence or straw bale barrier has occurred due to concentrated flow. Anchored compost layer shall be used on upslope face in HQ and EV watersheds.

Sediment shall be removed when accumulations reach 1/3 the height of the outlet.

COMPOST FILTER SOCK



SECTION VIEW
NTS



PLAN VIEW
NTS

Filtrexx

Sock fabric shall meet standards of Table 4.1. Compost shall meet the standards of Table 4.2.

Compost filter sock shall be placed at existing level grade. Both ends of the sock shall be extended at least 8 feet up slope at 45 degrees to the main sock alignment (Figure 4.1).

Maximum slope length above any sock shall not exceed that shown on Figure 4.2. Stakes may be installed immediately downslope of the sock if so specified by the manufacturer.

Traffic shall not be permitted to cross filter socks.

Accumulated sediment shall be removed when it reaches half the aboveground height of the sock and disposed in the manner described elsewhere in the plan.

Socks shall be inspected weekly and after each runoff event. Damaged socks shall be repaired according to manufacturer's specifications or replaced within 24 hours of inspection.

Biodegradable filter socks shall be replaced after 6 months; photodegradable socks after 1 year.

Polypropylene socks shall be replaced according to manufacturer's recommendations.

Socks with diameters less than 12" should only be used for residential housing lots of $\frac{1}{4}$ acre or less that are tributary to a sediment basin or sediment trap.

The maximum slope length above a compost filter sock should not exceed those shown in Figure 4.2.

Upon stabilization of the area tributary to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed. In the latter case, the mesh shall be cut open and the mulch spread as a soil supplement.

**TABLE 4.1
Compost Sock Fabric Minimum Specifications**

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years
Two-ply systems					
Inner Containment Netting	HDPE biaxial net				
	Continuously wound				
	Fusion-welded junctures				
Outer Filtration Mesh	3/4" X 3/4" Max. aperture size				
	Composite Polypropylene Fabric (Woven layer and non-woven fleece mechanically fused via needle punch)				
	3/16" Max. aperture size				
Sock fabrics composed of burlap may be used on projects lasting 6 months or less.					

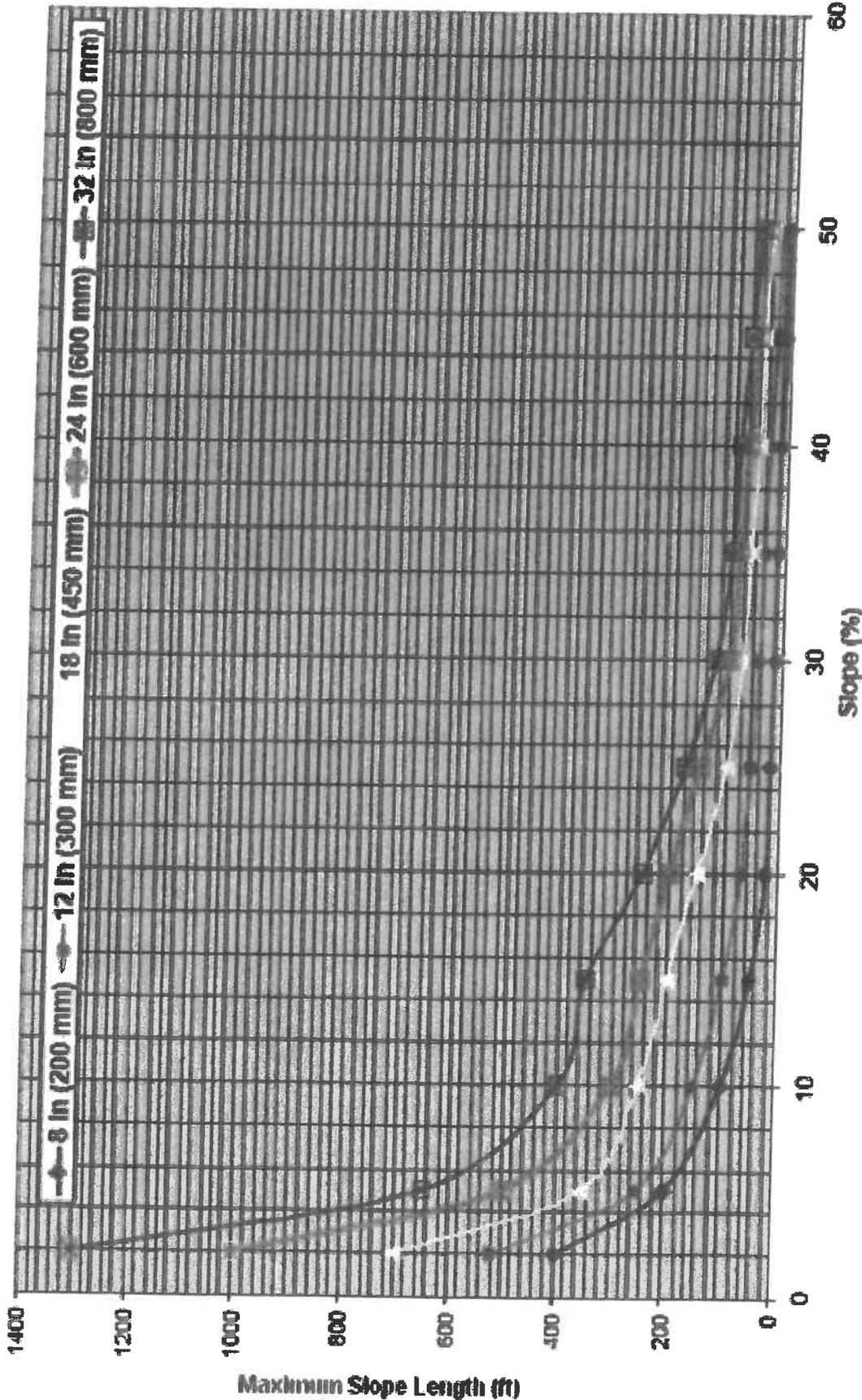
Filtrexx & JMD

**TABLE 4.2
Compost Standards**

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

Filtrexx

FIGURE 4.2
MAXIMUM PERMISSIBLE SLOPE LENGTH ABOVE COMPOST FILTER SOCKS



NOTE: 8" diameter socks should only be used to control small ($\leq \frac{1}{2}$ acre) disturbed areas on individual house lots).

Example: at 5% slope the maximum slope length above the compost filter sock should not exceed 200 feet.

SEEDING MIXTURES

Species Mix	Pounds/Acre	Pounds/1000 sq.ft.
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PERMANENT SEEDING

Slopes & Banks (non-mowed) Well Drained/Sunny

Crownvetch, plus	10	0.2 (3 oz.)
Tall Fescue, or	20	0.5 (8 oz.)
Perennial Ryegrass	20	0.5 (8 oz.)
Flatpea, plus	20	0.5 (8 oz.)
Tall Fescue, or	20	0.5 (8 oz.)
Perennial Ryegrass	20	0.5 (8 oz.)

Slopes & Banks (mowed) Variable Drainage/Shaded

Birdsfoot Trefoil, plus	6	0.15 (3 oz.)
Tall Fescue, plus	30	0.7 (11 oz.)
Redtop	3	0.1 (2 oz.)
Tall Fescue, plus	60	1.4 (22 oz.)
Redtop	3	0.1 (2 oz.)

Slopes & Banks (mowed) Well Drained/Shaded

Tall Fescue	60	1.4 (22 oz.)
Red (fine) Fescue, or	35	0.8 (13 oz.)
Kentucky Bluegrass, plus	25	0.6 (10 oz.)
Redtop, or	3	0.1 (2 oz.)
Perennial Ryegrass	15	0.3 (5 oz.)
Tall Fescue, plus	40	1.0 (16 oz.)
Red (fine) Fescue	10	0.2 (3 oz.)

TEMPORARY SEEDING

Spring Oats, or	96	2.2 (35 oz.)
Winter Wheat, or	180	4.1 (66 oz.)
Winter Rye, or	168	3.8 (62 oz.)
Annual Ryegrass	40	1/0 (16 oz.)

Soil Amendment Application Rate Equivalents

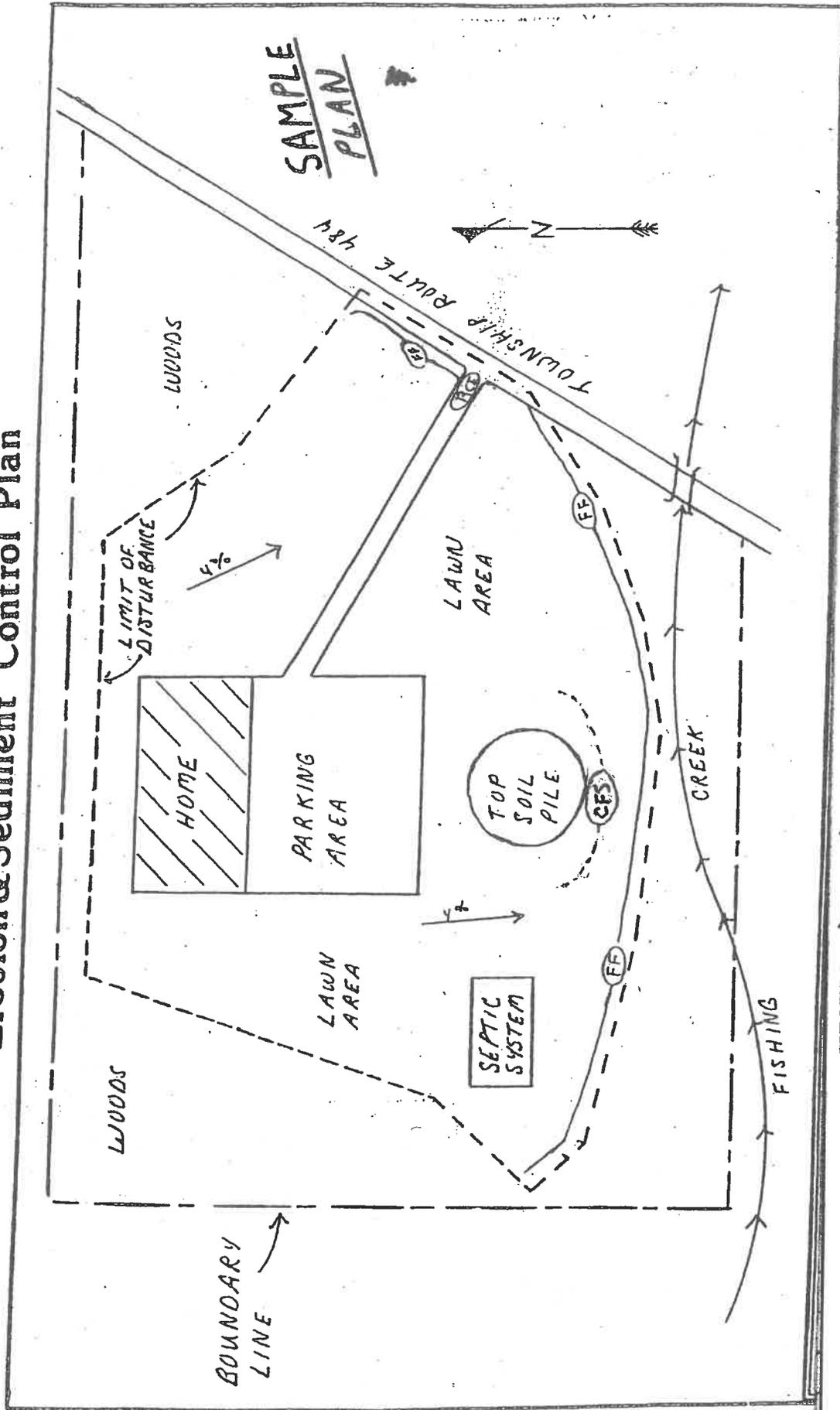
Soil Amendment	Permanent Seeding Application Rate			Notes
	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yd.	
Agricultural lime	6 tons	240 lb.	2,400 lb.	Or as per soil test; may not be required in agricultural fields
10-10-20 fertilizer	1,000 lb.	25 lb.	210 lb.	Or as per soil test; may not be required in agricultural fields
Temporary Seeding Application Rate				
Agricultural lime	1 ton	40 lb.	410 lb.	Typically not required for topsoil stockpiles
10-10-10 fertilizer	500 lb.	12.5 lb.	100 lb.	Typically not required for topsoil stockpiles

Adapted from Penn State, "Erosion Control and Conservation Plantings on Noncropland"

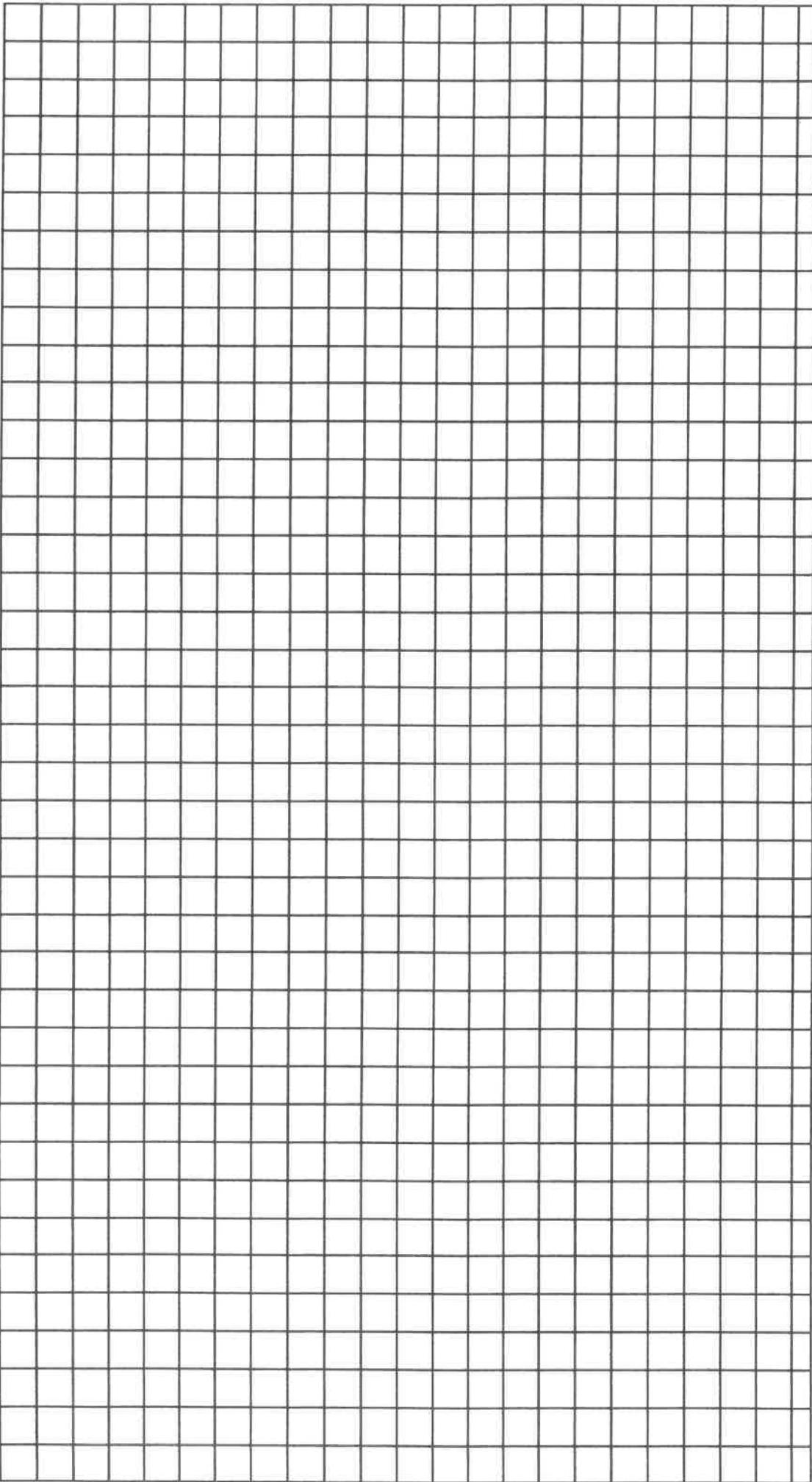
For more information about Erosion and Sediment Control contact:

Wayne Conservation District
648 Park Street
Honesdale, Pa 18431
Telephone: 570-253-0930
FAX: 570-253-9741
Email: waynecd@co.wayne.pa.us

Erosion & Sediment Control Plan



ROAD	====	CULVERT	~~~~~	PROPERTY OWNER:	_____
STREAM	→	COMPOST FILTER SOCK	... (CFS) ...	PROJECT:	_____
BOUNDARY LINE	- - - -	FILTER FABRIC FENCE	- FF -	MUNICIPALITY:	_____
SLOPE	5%	ROCK FILTER BERM	~~~~~	DATE:	_____
ROCK CONSTRUCTION ENTRANCE	▨	LIMIT OF DISTURBANCE	- - - - -	APPROXIMATE SCALE: 1" =	_____



ROAD 
STREAM 
BOUNDARY LINE 
SLOPE  5%
ROCK CONSTRUCTION ENTRANCE 

CULVERT 
COMPOST FILTER SOCK 
FILTER FABRIC FENCE 
ROCK FILTER BERM 
LIMIT OF DISTURBANCE 

PROPERTY OWNER: _____
PROJECT: _____
MUNICIPALITY: _____
DATE: _____
APPROXIMATE SCALE: 1" = _____