Erosion and Sediment Control for Earth Moving Activities

When is an Erosion and Sedimentation (E&S) plan required?

Any earth disturbance is required to protect the site from accelerated erosion through the use of Best Management Practices (BMPs). Some of these BMPs include, but are not limited to such things as filter fabric fence (silt fence), rock filters, stabilized entrances to the site, grass buffers, diversion of upslope water, and seeding and mulching of disturbed areas.

Any disturbance over 5,000 square feet requires a written E&S plan to be developed and kept on site. Most construction generally that takes place disturbs more than 5,000 sq. ft whether it is building a garage or putting in a driveway.

Additional permits may be required if the earth disturbance is over 1 acre (43,560 sq. ft) over the life of the project. Contact the Lycoming County Conservation District for regulations and guidance.

An E&S plan minimizes sediment runoff from an earthmoving activity. This in turn reduces sediment polluting nearby waterways and water bodies.

The implementation and maintenance of erosion and sediment control BMP’s (best management practices) are required to minimize the potential for accelerated erosion and sedimentation, including those activities which disturb less than 5,000 square feet. This means that regardless if a plan is reviewed by the conservation district, best management practices (E&S controls) must be in place, operating properly, and maintained throughout the life of the project.

What does an E&S Plan consist of?

- E&S Plans outline BMPs used to minimize erosion problems associated with earthmoving activities.
- A complete plan may include:
  - Topographical maps
  - Project site sketches
  - Details for E&S Controls
  - Soils maps
  - Narrative description of the project
Please print: Complete all spaces in the application. If there are questions, please contact the conservation district for assistance.

**Landowner Name:** __________________________________________________________

Mailing Address _____________________________________________________________

City/State/Zip code ___________________________________________________________

Contact Information _________________________________________________________

**Excavator Name:** _________________________________________________________

Mailing Address _____________________________________________________________

City/State/Zip code ___________________________________________________________

Contact Information _________________________________________________________

Project location ________________________________ (municipality, city, borough, township)

Has the municipality been contact? ___________

Total project (acres) __________ Disturbed acres ________________

Name of watershed or nearest receiving stream in which the project is proposed.
________________________________________________________________________________________

Please provide specific directions to project location. Include distances, landmarks, or special features. Also attach a map if possible.
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

Briefly describe the project:
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

Is the earth disturbance within a floodway or 50 ft from a stream or waterway?

Yes _______  No _______
Estimated dates for start and completion of project:
Start date: _______________  End date: _______________

**Total amount of disturbed area:**

\[
\text{Total length} \times \text{Total width} = \text{Area (sq ft)}
\]

Access roads/Driveways: _________ X _________ = _________
Foundation/Building: _________ X _________ = _________
Lawn/Landscaping: _________ X _________ = _________
Other: _________ X _________ = _________

Total area = _____________ sq. ft.

Total area _____________ sq ft ÷ 43,560 = _______________ Disturbed acres

Are steep slopes in excess of 10% within your project boundaries, or in the immediate surrounding areas?
Yes _________  No _________

Does off-site drainage exist? Yes _________  No _________

Will the project increase runoff from the site? Yes _________  No _________

Are you aware of a discharge to surface waters of the Commonwealth or existing offsite drainage which may occur from this construction site? Yes _________  No _________

**Soil Type:** List the type(s) of soil found on the property and include a map of soil locations and a topographic map. (Soils maps are available at http://websoilsurvey.nrcs.usda.gov/app/ or contact the Lycoming County Conservation District):

________________________________________________________________________________________

**Soils limitations and how they will be addressed:** Include additional sheets if needed.

________________________________________________________________________________________

**Sequence of Construction:** Be specific and provide steps from beginning of work to the end. Attach additional sheets if needed.

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________
**Temporary Best Management Practices:** This section details what temporary BMPs will be utilized during the project. Check each control that will be used.

- Rock Construction Entrance
- Temporary Seeding
- Filter Fabric Fence (Silt fence)
- Mulching
- Straw Bale Barrier
- Channel lining (netting)
- Rock filters
- Diverting upslope water
- Rock outlet protection
- Other
- Sediment trap
- Other

**Check:**
- All items checked above will be to DEP specifications.
- Alternative controls will be maintained as per manufacturer’s specifications and are attached.

**Permanent Best Management Practices:**
Prior to the completion of the project, state law requires that completion of any stage or phase of the earth disturbance activity requires immediate seeding, mulching or other protection from accelerated erosion and sedimentation. Implementation and maintenance of BMP's (Best Management Practices) are required until the completion of permanent stabilization of the disturbed area. Types of permanent stabilization include:

1. Uniform 70% perennial vegetative cover, with density capable of resisting erosion or
2. Other acceptable BMPs that permanently minimize accelerated erosion and sedimentation.

All disturbed areas must be protected to prevent accelerated erosion. In other words, soil cannot be left exposed. Revegetating an area should include the seeding mixture that will be used. Please provide how the site will be stabilized (i.e. vegetation, stone, pavement, etc.).
**Maintenance Program:**  All erosion control practices require maintenance to function properly. Please note the following required maintenance procedures and check other applicable procedures for control measures you will be using.

Until the site is stabilized, all erosion controls must remain in place and be maintained properly. Maintenance must include weekly inspections and inspections after each runoff event. All preventative and remedial maintenance work, including clean out, repair, and replacement must be done immediately.

After final stabilization has been achieved temporary erosion and sedimentation controls may be removed. Any disturbance created by the removal of these controls shall be stabilized. Stabilization is a uniform 70% vegetative cover or another type of cover that prevents accelerated erosion from the site (i.e. stone, pavement, etc.)
Sketch Plan: Please provide a sketch of the project showing the location of all BMPs. Direction of slope should be indicated as well as the entire project and surrounding areas. (Use back of the sheet or additional sheets if necessary.)
Topsoil should be removed prior to installation of rock construction entrance.

Runoff shall be diverted from roadway to a suitable sediment removal BMP prior to entering Rock Construction Entrance.

Mountable berm should be installed wherever optional culvert pipe is used. Pipe to 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 feet increments until condition is alleviated or install wash rack. Washing the roadway or sweeping the deposits into roadway ditches, sewer, culverts, or other drainage ways is not acceptable.
Sediment Barrier Alignment

**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**

Fabric shall be 30” minimum.

Silt Fence must be placed at level existing grade. Both ends of the barrier must be extended at least 8 feet up slope at 45 degrees to the main barrier alignment.
Sediment must be removed when accumulations reach 1/2 the above ground height of the fence.

Any section of Silt Fence which has been undermined or topped must be immediately replaced with a Rock Filter Outlet. See standard detail below.

Fence shall be removed and properly disposed of when tributary area is permanently stabilized.
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 (see Figure 4.1). Maximum slope length above any sock shall not exceed that shown on Figure 4.2.

Traffic shall not be permitted to cross filter socks.

Accumulated Sediment shall be removed when it reaches ½ the above ground 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 sock shall be replaced after 6 months; photodegradable socks after 1 year. Polypropylene socks shall be replaced according to manufacturer’s recommendations.

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.
A Rock Filter Outlet shall be installed where failure of a Straw Bale Barrier or Filter Fabric Fence has occurred due to concentrated flow.

Sediment must be removed when accumulations reach 1/3 the height of the outlet.
### Recommended Seed Mixtures

<table>
<thead>
<tr>
<th>Species</th>
<th>Seeding Rate - Pure Live Seed ¹</th>
<th>Most Sites</th>
<th>Adverse Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring oats (spring), or</td>
<td>64</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Annual ryegrass (spring or fall), or</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Winter wheat (fall), or</td>
<td>90</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Winter rye (fall)</td>
<td>56</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>Tall fescue, or</td>
<td>60</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Fine fescue, or</td>
<td>35</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Kentucky bluegrass, plus</td>
<td>25</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Redtop¹, or</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Perennial ryegrass</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Birdsfoot trefoil, plus</td>
<td>6</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Tall fescue</td>
<td>30</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Birdsfoot trefoil, plus</td>
<td>6</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Reed canarygrass</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Crownvetch, plus</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Tall fescue, or</td>
<td>20</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Perennial ryegrass</td>
<td>20</td>
<td>25</td>
<td></td>
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<tr>
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<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Tall fescue</td>
<td>20</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Flatpea, plus</td>
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</tr>
<tr>
<td>Tall fescue, or</td>
<td>20</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Perennial ryegrass</td>
<td>20</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Serecia lespedeza, plus</td>
<td>10</td>
<td>20</td>
<td></td>
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<tr>
<td>Tall fescue, plus</td>
<td>20</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Redtop¹</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Tall fescue, plus</td>
<td>40</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Fine fescue</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Deertongue, plus</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Birdsfoot trefoil</td>
<td>6</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Switchgrass, or</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Big Bluestem, plus</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Birdsfoot trefoil</td>
<td>6</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Orchardgrass, or</td>
<td>20</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Smooth bromegrass, plus</td>
<td>25</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Birdsfoot trefoil</td>
<td>6</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Penn State, “Erosion Control & Conservation Plantings on Noncropland,”

1. Pure Live Seed (PLS) is the product of the percentage of pure seed times percentage germination divided by 100. For example, to secure the actual planting rate for switchgrass, divide 12 pounds PLS shown on the seed tag. Thus, if the PLS content of a given seedlot is 35%, divide 12 PLS by 0.35 to obtain 34.3 pounds of seed required to plant one acre. All mixtures in this table are shown in terms of PLS.

2. If high-quality seed is used, for most sites seed spring oats at a rate of 2 bushels per acre, winter wheat at 11.5 bushels per acre, and winter rye at 1 bushel per acre. If germination is below 90%, increase these suggested seeding rates by 0.5 bushel per acre.
3. This mixture is suitable for frequent mowing. Do not cut shorter than 4 inches.
4. Keep seeding rate to that recommended in table. These species have many seeds per pound are very competitive. To seed small quantities of small seeds such as weeping lovegrass and reedtop, dilute with dry sawdust, sand, rice hulls, buckwheat hulls, etc.
5. Use for highway slopes and similar sites where the desired species after establishment is crownvetch. (Notes continued on following page)
6. Use only in extreme southeastern or extreme southwestern Pennsylvania. Serecia lespedeza is not well adapted to most of Pa.

7. Do not mow shorter than 9 to 10 inches.
8. Seed mixtures containing crown vetch should not be used in areas adjacent to wetlands or stream channels due to the invasive nature of this species.

**MULCHING** - Mulches absorb rainfall impact, increase the rate of infiltration, reduce soil moisture loss due to evaporation, moderate soil temperatures, provide a suitable environment for germination, and protect the seedling from intense sunlight. All seeded areas shall be mulched or blanketed to minimize the potential for failure to establish an adequate vegetative cover. Mulching may also be used as a temporary stabilization of disturbed areas in non-germinating seasons. Apply clean straw as a mulch at a rate of 3T/acre.

**Straw Mulch at Various Rates of Application**

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**Rule of Thumb:** If you are seeing bare ground, there is not enough straw.
(Caution: Too much straw can be as harmful as too little straw.)

Apply mulches at the rates shown in Table below.

Straw and hay mulch should be anchored immediately after application to prevent being windblown. A tractor-drawn implement may be used to “crimp” the straw or hay into the soil (about 3”). This method should be limited to slopes no steeper than 3H:1V. The machinery should be operated on the contour. (Note: Crimping of hay or straw by running over it with tracked machinery is not recommended.)

Mulch on slopes of 8% or steeper should be held in place with netting. Lightweight plastic, fiber, or paper nets may be stapled over the mulch according to manufacturer’s recommendations.

Shredded paper hydromulch should not be used on slopes steeper than 5%. Wood fiber hydromulch may be applied on steeper slopes provided a tackifier is used. The application rate for any hydromulch should be 2,000 lb/acre (min.).

### Mulch Application Rates

<table>
<thead>
<tr>
<th>Mulch Type</th>
<th>Application Rate (Min.)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per Acre</td>
<td>Per 1,000 sq. ft.</td>
</tr>
<tr>
<td>Straw</td>
<td>3 tons</td>
<td>140 lb.</td>
</tr>
<tr>
<td>Hay</td>
<td>3 tons</td>
<td>140 lb.</td>
</tr>
<tr>
<td>Wood Chips</td>
<td>4 - 6 tons</td>
<td>185 - 275 lb.</td>
</tr>
<tr>
<td>Hydromulch</td>
<td>1 ton</td>
<td>47 lb.</td>
</tr>
</tbody>
</table>
If project is below roadway or on a side slope, BMP’s should be placed down slope of earth disturbance.