

Section V:

BMP'S FOR SEDIMENT COLLECTION

Contents and Applicability

Best Management Practices (BMP's):

- V.1 Straw Bale Barrier.** Straw bales can be used where temporary diversions or berms are required. The straw allows water to filter through and retains the sediment. Frequent inspection is necessary.
- V.2 Sediment Traps or Catch Basins.** A basin for capturing sediment from runoff water.
- V.3 Vegetated Buffer Strip.** An undisturbed area containing native vegetation over which runoff water flows before entering streams or lakes.
- V.4 Silt Fence/Filter Fence.** A barrier constructed of filter cloth which is designed to trap sediments while allowing runoff water to flow through the barrier.
- V.5 Brush Sediment Barriers.** A sediment barrier constructed of brush or brush and filter fabric.
- V.6 Sediment/Settling Ponds.** A pond constructed, in a drainage or draw, which catches and holds sediment laden water.
- V.7 Slash Filter Windrows.** A sediment trap built of windrowed slash.
- V.8 Log and brush check dams.** A sediment trap built of logs and brush.

BMP'S FOR SEDIMENT COLLECTION

V.1 Straw Bale Barriers

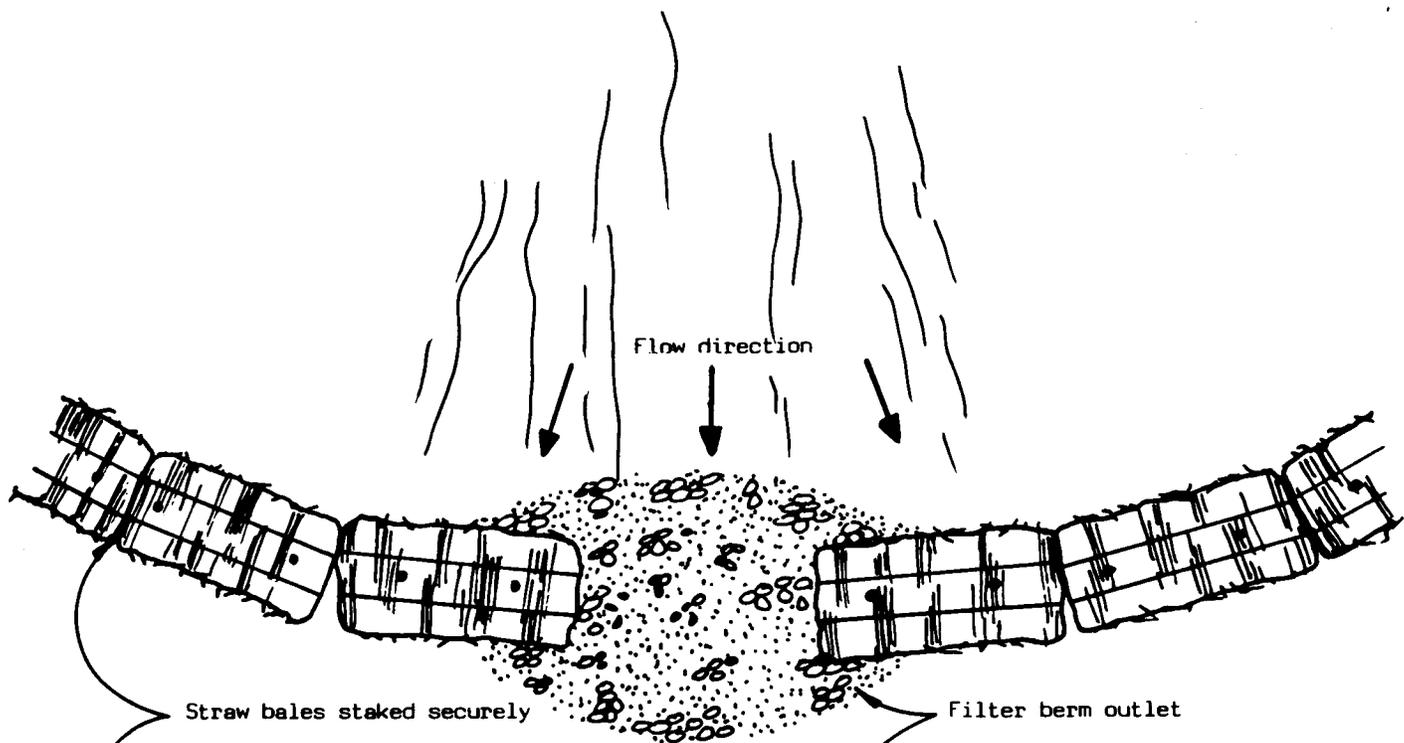
Purpose: Straw bales can be used as a temporary berm, diversion, or barrier to help contain sediment on site by catching and filtering spring runoff.

Application: The barriers may be used across small swales, in ditches, and at the toe of bare slopes where there is a temporary, large volume of sediment laden runoff.

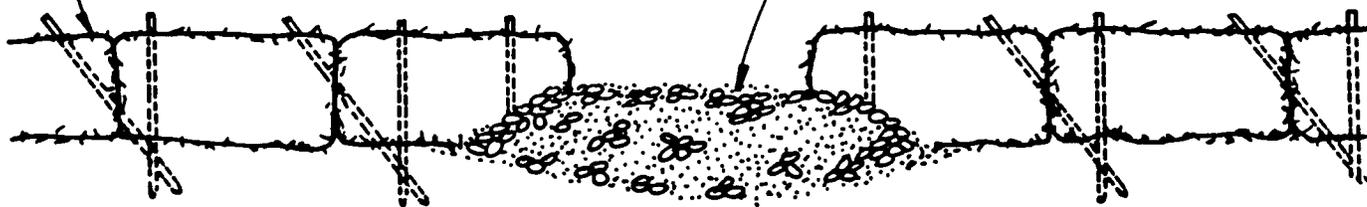
Specifications: (See Figure V-1A and V-1B)

1. Bales should be laid on their side and staked in place with either wooden or metal stakes. The stakes should be driven through the bale and at least one (1) foot into the ground.
2. Piping (flow of water underneath the bales) can be reduced by placing the bales in a small (six inches deep) trench.
3. Wire or nylon tied bales last longer than bales tied with twine.

Maintenance: Straw bale sediment barriers should be inspected on a regular basis and immediately repaired or replaced when damaged.

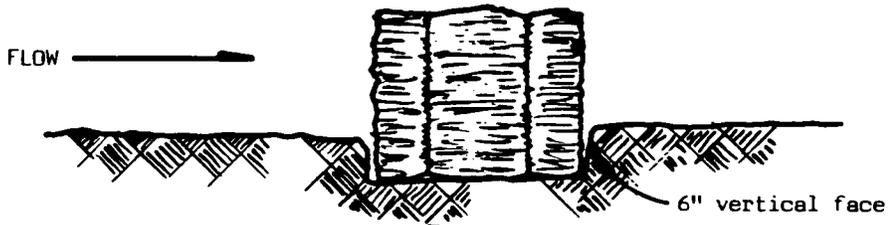


PLAN VIEW

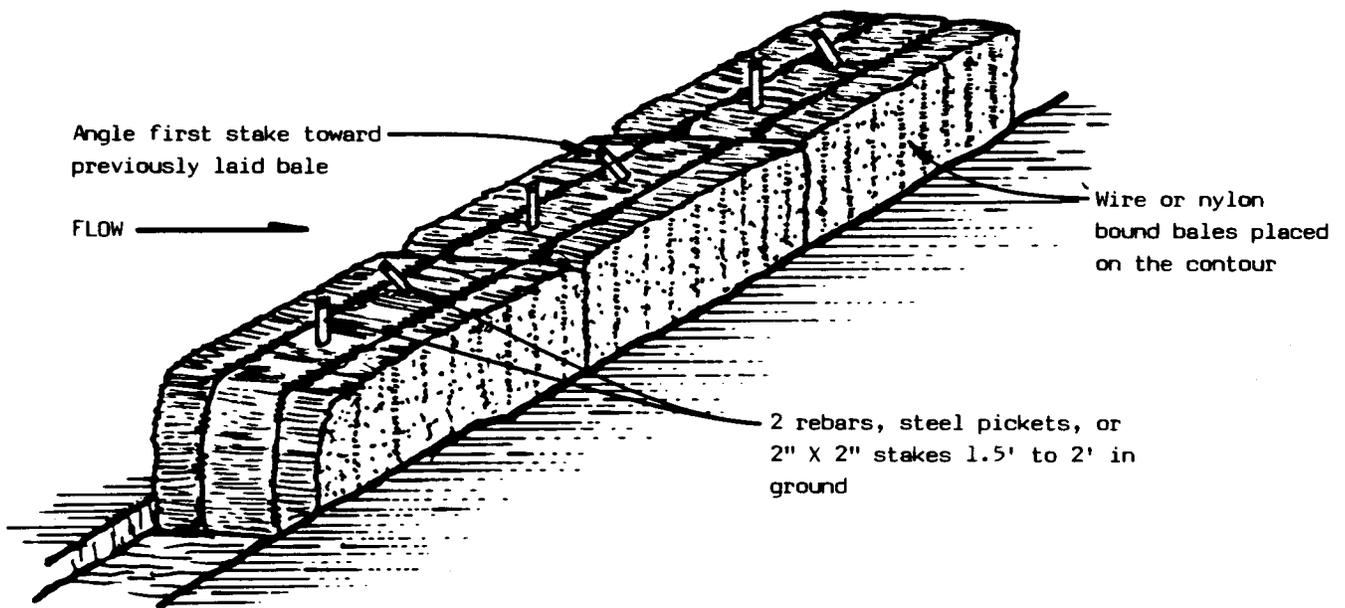


ELEVATION

Semi-pervious barrier of straw bales with more pervious embankment of sand and gravel for spillway.



EMBEDDING DETAIL



ANCHORING DETAIL

BMP'S FOR SEDIMENT COLLECTION

V.2 Sediment Traps or Catch Basins

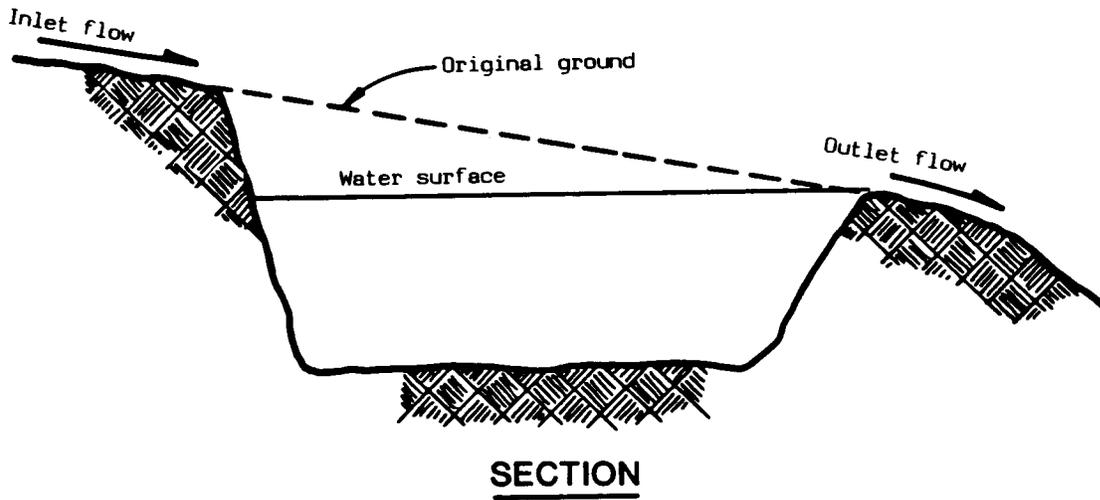
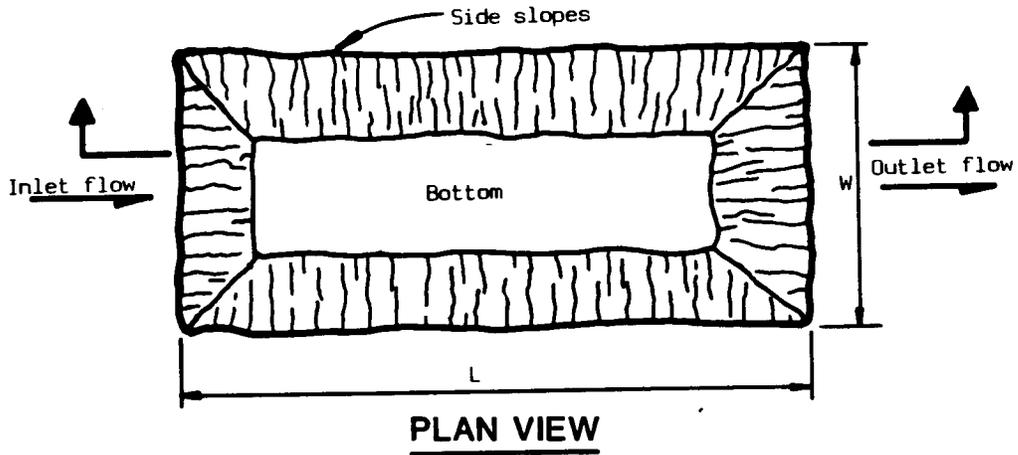
A sediment trap or catch basin is a temporary or permanent structure used to catch and store sediment laden surface runoff.

Purpose: Small temporary structures should be used to catch runoff containing sediment from temporary roads and construction sites. Larger permanent basins should be constructed to catch periodic sediment laden runoff from permanent erosion control structures, i.e. culverts, water bars, etc.

Specifications: (See Figure V-2)

1. The basin should be large enough to retain sediment from major seasonal storm events. It will need to be cleaned periodically during periods of high runoff and each fall.
2. The slopes of the catch basin should be seeded, if possible. This will increase their stability and help decrease additional erosion.
3. Large, permanent structures may require spillways so water can be decanted. Either a pipe spillway, which discharges to vegetated ground, or a natural outflow covered with geotextile fabric is acceptable.

Maintenance: Catch basins should be inspected on a regular basis and should be cleaned out and/or repaired as needed.



BMP'S FOR SEDIMENT COLLECTION

V.3 Vegetated Buffer Strip

Purpose: Vegetated ground can serve as a permanent or temporary trap to catch and hold sediment from runoff water flowing across it.

Application: A strip of vegetated ground could be established at many locations between the source of sediment and live water sources. The vegetative cover could be either native or planted.

Specifications:

1. Try to direct sediment laden water onto naturally vegetated or planted ground.
2. Tall, dense stands of grass form good sediment traps, as do willows and alder. The willows and alder can either be native or planted. A combination of grasses and willows or alder is also effective.
3. Fertilizing seeded or planted ground will enhance growth.
4. Sediment laden water should not be directed onto vegetated buffer strips within 25 feet of a Class II stream or within 75 feet of a Class I stream.

Maintenance: Native vegetated ground should not need maintenance. Planted ground should not be used as a sediment trap until vegetation is well established. The area should be inspected periodically to ensure that water running across the vegetated ground is not causing additional erosion.

BMP'S FOR SEDIMENT COLLECTION

V.4 Silt Fence/Filter Fence

A silt fence/filter fence is a low fence made of filter fabric, wire, and steel posts used to filter sediment out of runoff water before it is discharged.

Purpose: Silt fences should be used on sites where there is a potential for sediment laden runoff caused by man made surface disturbance to be discharged.

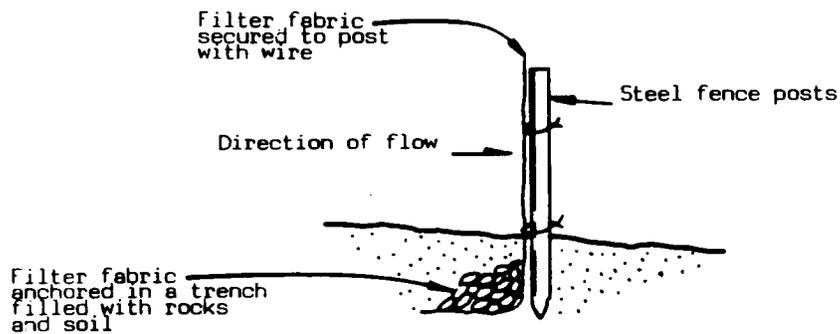
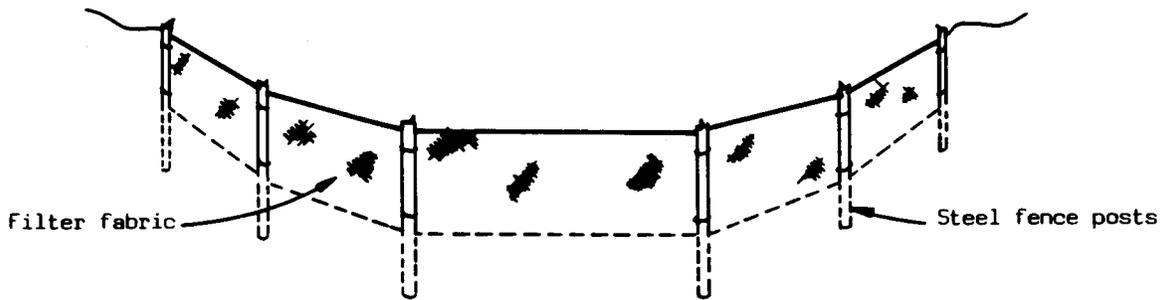
Application: Silt fences should be used on small ephemeral drainages where surface water collects or leaves a mine site. Silt fences are easier to maintain and remove without creating lasting impacts to the environment. They must be cleaned periodically to maintain their effectiveness.

Specifications: (See Figure V-4)

1. Construction material: filter fabric, steel fence posts, wire.
2. Excavate a trench at the uphill side of the planned fence location to a depth of at least six (6) inches.
3. Drive steel fence posts into the ground, to a depth adequate to make the fence stable, on the downhill side of the trench.
4. Stretch the filter fabric between the posts and wire it in place.
5. Lower the fabric into the trench and cover with rocks and compacted soil so water can not wash out under the fabric.

Maintenance: Silt fences should be inspected periodically, especially during periods of high runoff. They should also be cleaned and repaired on a regular basis and every fall.

Silt fencing may not be as effective as straw bales in areas with a high clay content as the clay tends to clog the filter fabric and impede the flow of water.



SECTION

BMP'S FOR SEDIMENT COLLECTION

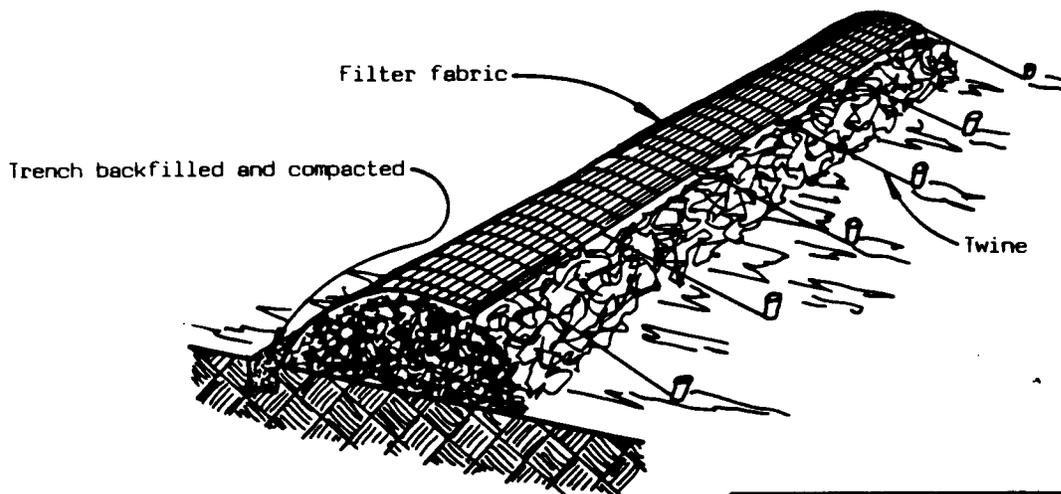
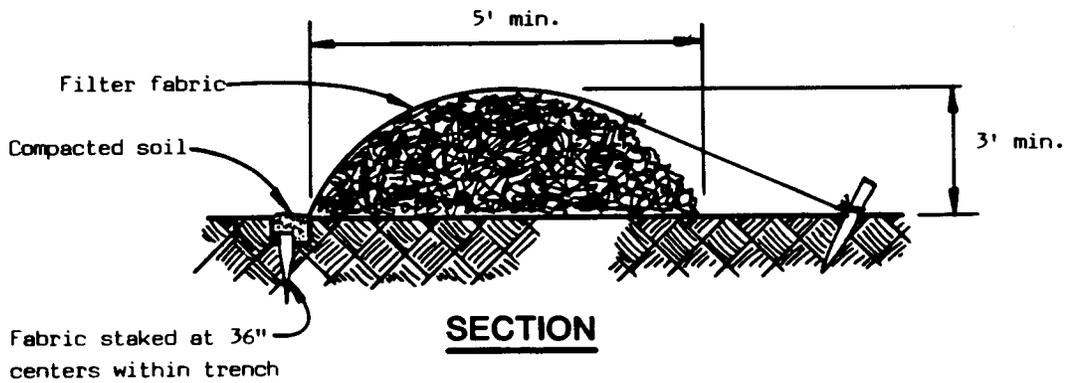
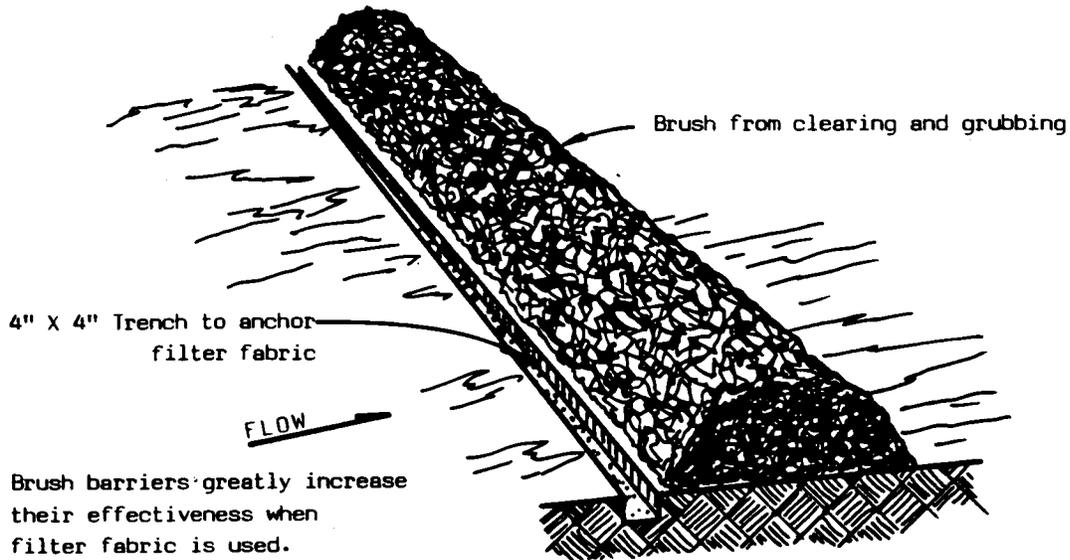
V.5 Brush Sediment Barrier

Purpose: Barriers constructed of brush or brush and filter fabric can serve as an effective sediment trap if runoff water is diverted through them.

Application: Brush sediment traps can be an effective permanent or temporary erosion control structure and are used below any surface disturbance. Brush sediment barriers can also enhance reclamation efforts by providing a source of slash to regrade over the mine site, before seeding.

Specifications: (See Figure V-5)

1. Pile brush in a semi-circle on the ground.
2. Dig a four-inch by four-inch trench on the uphill side of the brush pile adjacent to the pile.
3. Place filter fabric in the trench. Cover and compact with soil and rocks so water will not run under the fabric.
4. Place the filter fabric over the brush pile. Anchor in place as shown in Figure V-5.



BMP'S FOR SEDIMENT COLLECTION

V.6 Sediment/Settling Pond

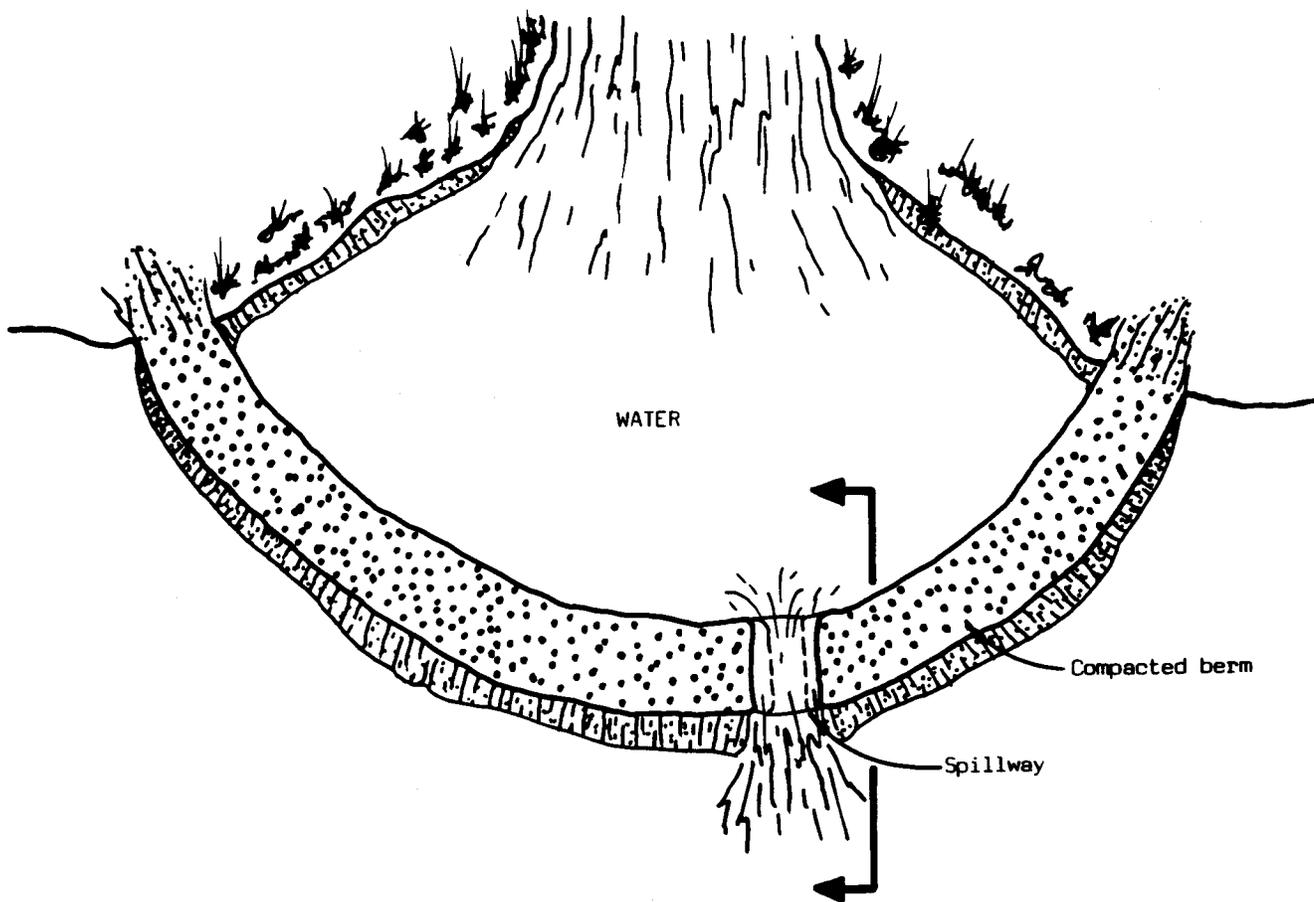
Purpose: Sediment ponds can serve as effective sediment traps, holding and storing sediment laden water for long periods of time. They can be designed with a spillway so that sediment free water can be allowed to decant off during periods of peak flow. Excess sediment free water could also be removed from the settling pond by land application, which entails dispersing it onto vegetated ground through pipes and a sprinkler system.

Application: Sediment/settling ponds are effective permanent holding facilities for sediment laden water that runs off a mine site. They can also be used to catch and retain water discharging from diversion dikes and drain fields, and they can be built below tailings dams to catch and hold seepage that might contain toxic substances.

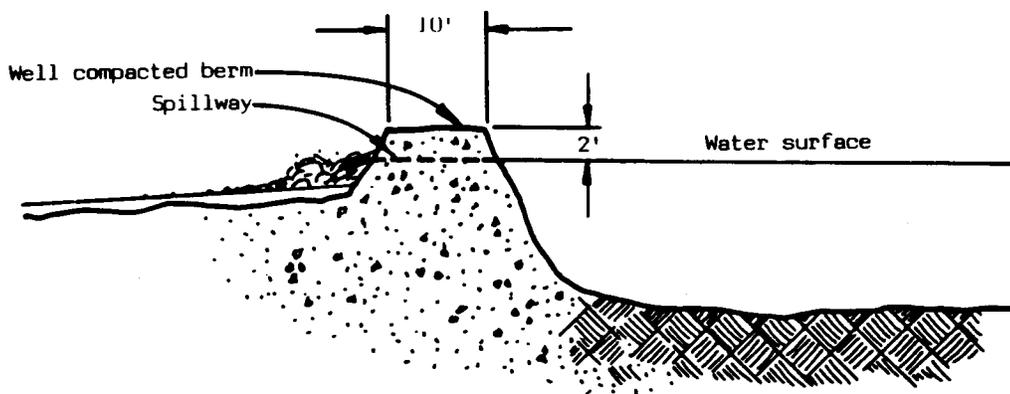
Specifications: (See Figure V-6)

1. Construct a well compacted semi-circle shaped berm at the lowest collection point on a bare slope.
2. Make the base of the berm wider than the top. This will increase its strength.
3. Build the berm high enough so that the pond can retain all runoff water and any excess from a major storm event.
4. Design a spillway into the berm so that sediment free water can be decanted off if necessary. The berm could be a sloped ramp, covered with jute matting, or a wooden, rock riprapped or concrete spillway.

Maintenance: Sediment ponds should be inspected on a regular basis, especially after peak runoff periods. Repairs should be made when needed.



PLAN VIEW



CROSS SECTION

BMP'S FOR SEDIMENT COLLECTION

V.7 Slash Filter Windrow

A slash filter windrow is a sediment barrier comprised of "windrowed" slash.

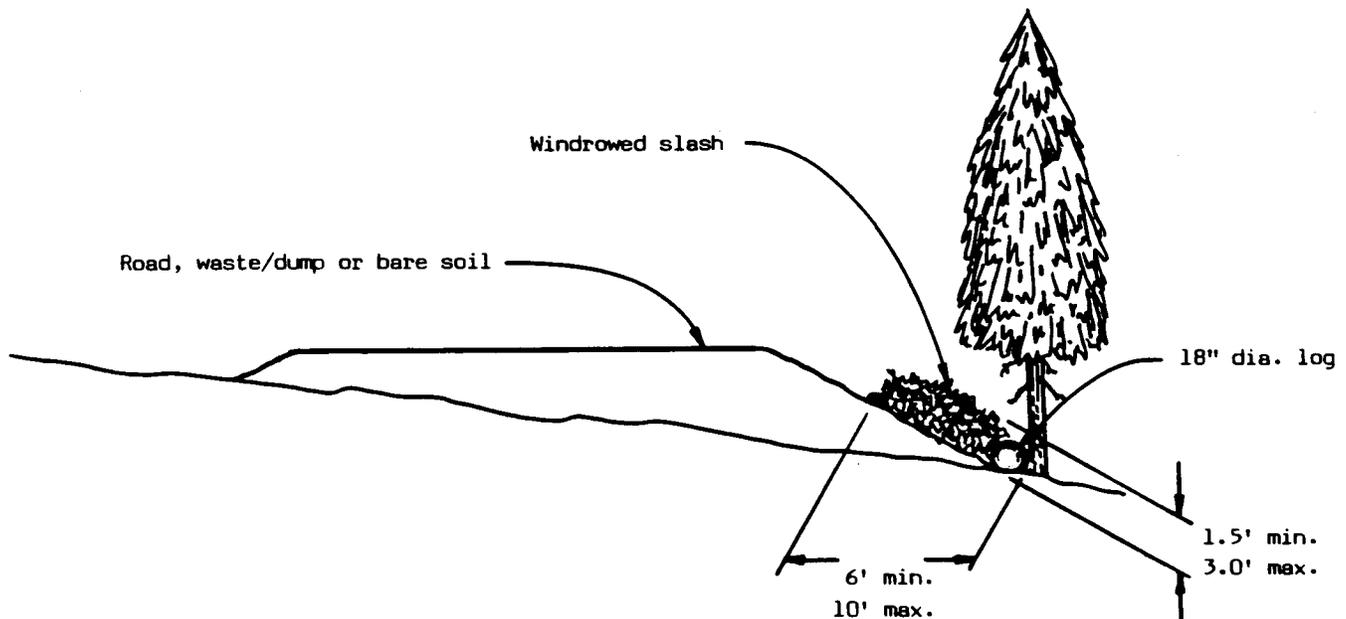
Purpose: Designed to catch and trap sediment coming off un-vegetated ground.

Application: Slash filter windrows are used to catch and retain sediment along road fill slopes at the toe of waste dumps, or adjacent to bare ground in steep terrain.

Specifications: (See Figure V-7)

1. When clearing an area of trees, stockpile the slash at designated sites so that it will be readily available for windrow construction.
2. Construct the windrow by removing a cull log of at least eighteen (18) inch diameter from the stockpile. Place it in a position at the toe of the fill or waste dump. The long dimension of the log should be parallel to the fill. Anchor the log in place against stumps, rocks, or other trees.
3. Stockpile slash on the fill slope, above the cut log. Compact the slash by tamping it in place with the bucket of the construction equipment you are using. Slash needs to be tamped in place so material will not flow under or through it.

Effectiveness: Slash filter windrows constructed below logging roads have proven to be from 75 to 85% effective in catching and retaining sediment.



SLASH FILTER WINDROW

FIGURE V-7

V.8 Log and Brush Check Dams

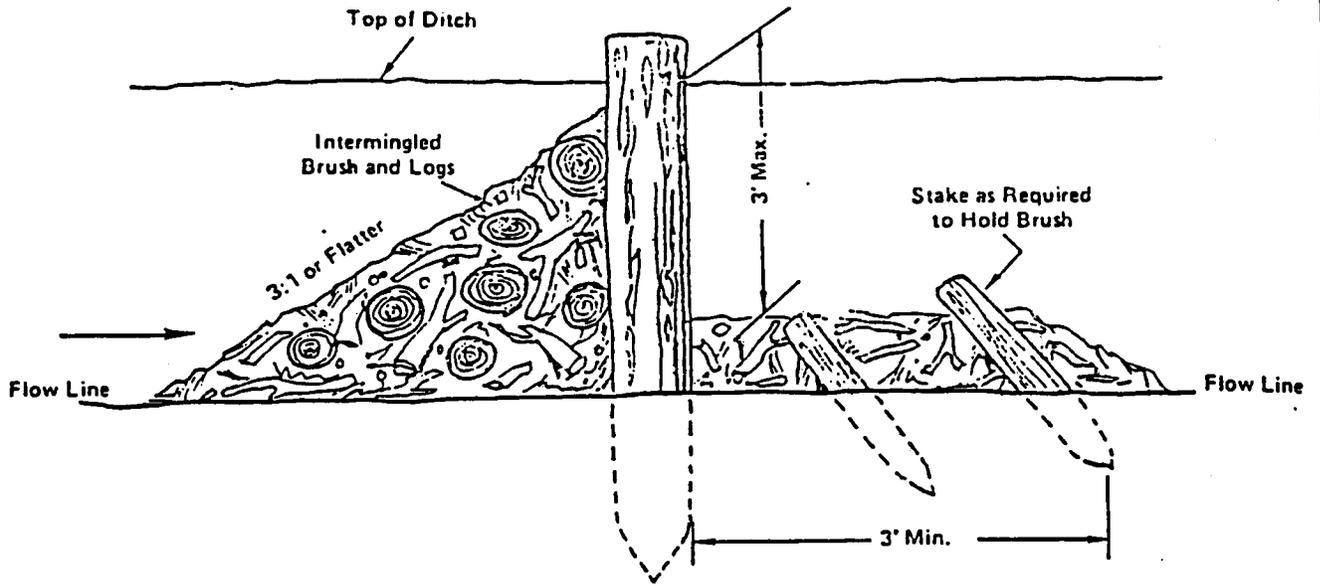
Purpose: Log check dams can be used to prevent or reduce erosion of banks and bottoms of channels, streams, and drainage-ways by reducing gradients and flow velocities.

Application: Log check dams can be installed in streams, channels, drainage-ways and ditches. Note: check dams can also be made using rocks, or wire fencing (see Figure V-8B or V-8C).

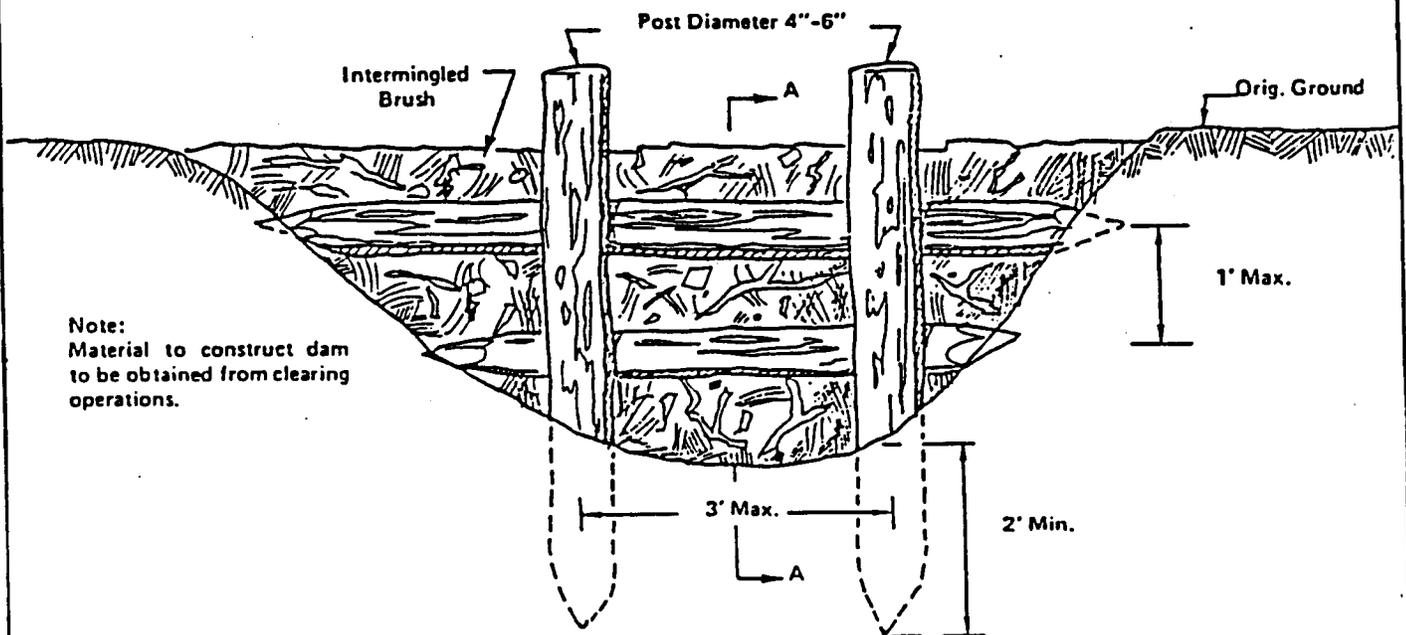
Specifications: (See Figure V-8A)

1. Check dams should be designed by an engineer. Typical specifications for log and brush check dams are shown in Figure V8-A.
2. Evaluate the gradient of the channel above and below the proposed dam site, prior to installation, to determine if erosion or sediment deposition will be a problem.
3. Locate the check dam in a straight section of the stream, channel, drainage-way, or ditch.
4. Drive 4" - 6" diameter posts into the bed of the channel to a minimum depth of 2 feet.
5. Maximum distance between posts should not exceed 3 feet from centerline to centerline of each post.
6. If using logs and brush, abut several logs against the posts, perpendicular to the flow. Logs should be a maximum of 1 foot apart. Pile brush and logs up behind dam as shown in Figure V-8A.

Maintenance: Check dams should be inspected periodically and repaired if necessary.



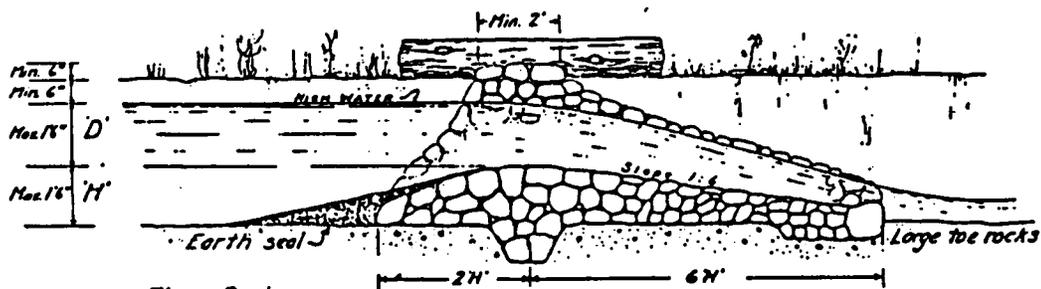
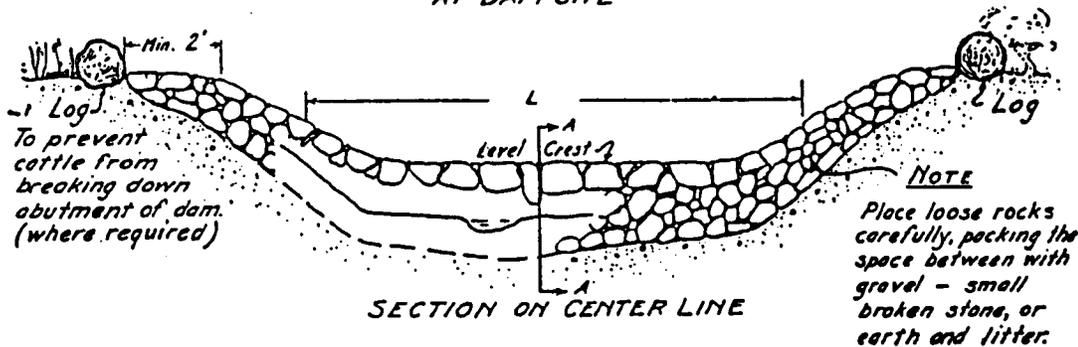
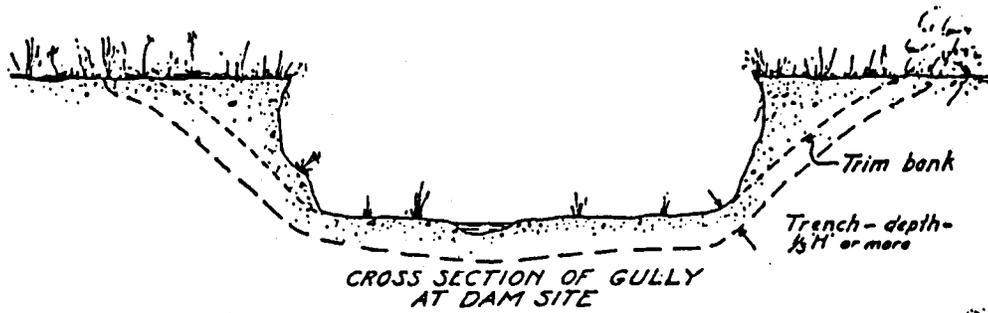
SECTION A-A



Note:
Material to construct dam
to be obtained from clearing
operations.

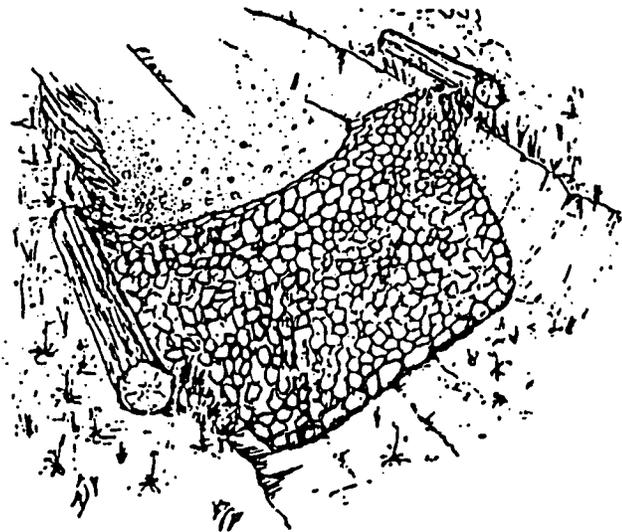
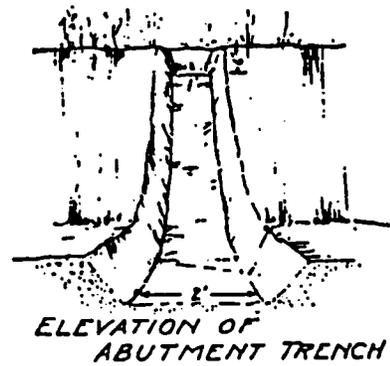
ELEVATION VIEW

LOG AND BRUSH CHECK DAM
FIGURE V-8A

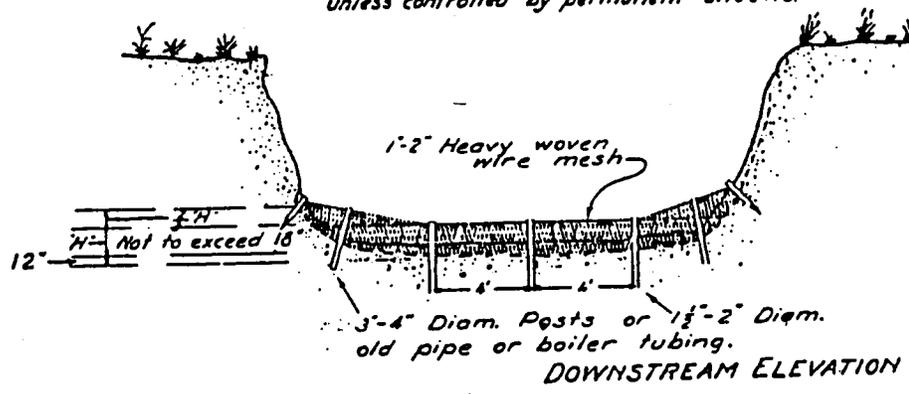
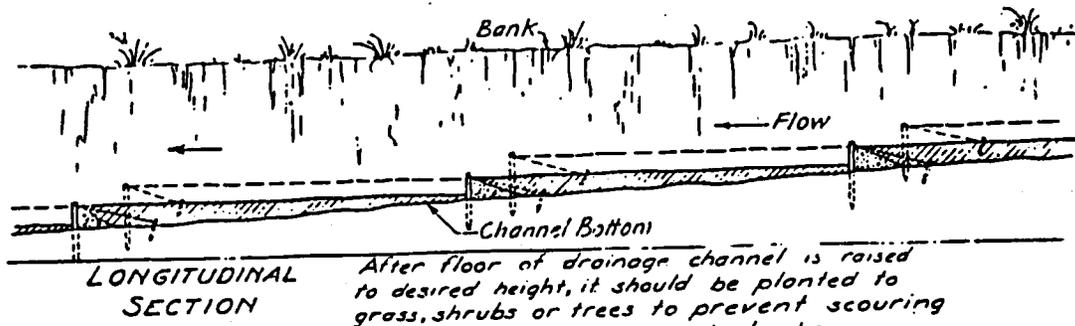


Flow Data

Depth 'D'	Per Ft. of Length L'
0.5 H	1.0 C.F.S.
1.0	3.0
1.5 (Max)	5.5



LOOSE ROCK CHECK-DAM
FIGURE V-8B



Set posts firmly, wire or staple mesh securely in place. Make anchor wires tight.

Flow Data

Depth "D"	Per Ft. of Length "L"
0.5 Ft.	1.0 c.f.s.
1.0 "	2.5 "
1.5 "	3.0 "

