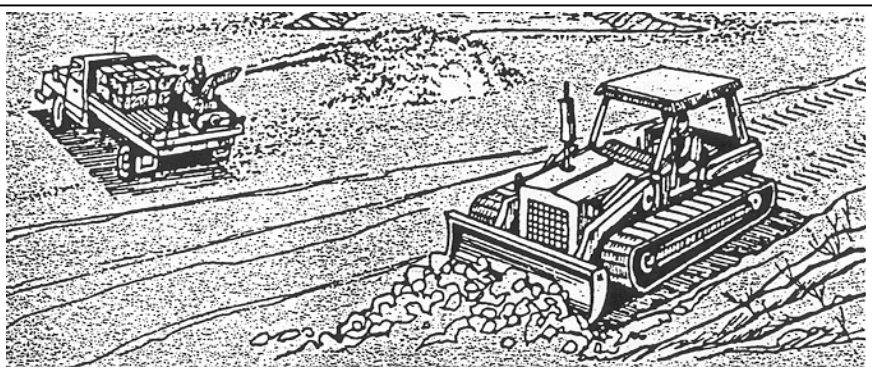
ACTIVITY: Contaminated or Erodible Surface Areas

ICP – 09



Targeted Constituents				
● Significant Benefit	◗ Partial Benefit	○ Low or Unknown Benefit		
● Sediment	● Heavy Metals	● Floatable Materials	● Oxygen Demanding Substances	
● Nutrients	● Toxic Materials	● Oil & Grease	○ Bacteria & Viruses	○ Construction Wastes

Implementation Requirements			
● High	◗ Medium	○ Low	
◗ Capital Costs	◗ O & M Costs	○ Maintenance	○ Training

Description

Prevent or reduce the discharge of pollutants to stormwater from contaminated or erodible surface areas by leaving as much vegetation on-site as possible, minimizing soil exposure time, stabilizing exposed soils, and preventing stormwater run-on into or controlling/treating run-off from contaminated areas. This management practice is likely to create significant reductions in sediment, nutrients, heavy metals, toxic materials, floatable materials, oxygen demanding substances, and oil and grease.

Approach

- The most effective way to control erosion is to preserve existing vegetation. Preservation of natural vegetation provides a natural buffer zone and an opportunity for infiltration of stormwater and capture of pollutants in the soil matrix. By preserving stabilized areas, it minimizes erosion potential, protects water quality, and provides aesthetic benefits. This practice is used as a permanent control measure.

- Contaminated or erodible surface areas can be controlled by:

  - Removal of contaminated soils,
  - Preservation of natural vegetation,
  - Re-vegetation,
  - Chemical stabilization,
  - Geosynthetics, or
  - Run-on diversion and/or Runoff control/treatment with sediment cups/basins or dry/wt detention ponds.

- Vegetation preservation on-site should be planned before disturbing the site. Preservation requires good site management to minimize the impact of construction when construction is underway.

- Proper maintenance is important to ensure healthy vegetation that can control erosion. Maintenance should be performed regularly especially during construction phases.

- Different species, soil types, and climatic conditions will require different maintenance activities such as mulching, fertilizing, liming, irrigation, pruning and weed and pest control.

Advantages of preservation of natural vegetation are:

- Vegetated areas can handle higher quantities of stormwater runoff than newly seeded areas.
- Removal of contaminated soils is a last resort , unless regulated by TDEC, and quite expensive. The level and extent of the contamination must be determined. This determination and removal must comply with State and Federal regulations, permits must be acquired, and fees paid.
- For a quick reference on disposal alternatives for specific wastes see ICP-12-1 presented in the Employee/Subcontractor Training BMP fact sheet.

Maintenance

- Maintenance should be minimal, except possibly if irrigation of vegetation is necessary.

Limitations

- Except for preservation of natural vegetation, each of the above solutions can be quite expensive depending upon the size of the area.
- Requires some planning to preserve and maintain the existing vegetation.
- May not be cost-effective with high land or contaminated soil disposal costs.
- Poor soils may limit the success of re-vegetated areas.
- Disadvantages of chemical stabilization include:
  - Creation of impervious surfaces.
  - May reduce erosion but cause different harmful effects on stormwater quality.
  - Is usually more expensive than vegetative cover.

Suitable Applications

This BMP addresses soils which are not so contaminated as to exceed criteria requiring a permit from the Tennessee Department of Environment and Conservation (TDEC), but the soil is eroding or carrying pollutants off in the stormwater. Much of the information presented in CP-09: Contaminated Soil Management can also be applied to this practice.

Of interest here are areas within the industrial site that are bare of vegetation and therefore subject to erosion. They may or may not be contaminated from past or current activities. Activity may or may not be occurring in the area of interest.

Contaminated or erodible surfaces can result from the human activities such as vegetation removal, compacting or disturbing soil, and changing natural drainage patterns. Industries must identify the areas of contaminated or erodible surfaces. The areas may include:

- Heavy activity where plants cannot grow.
- Soil stockpiles.
- Steep slopes.
- Construction areas.
- Demolition areas.

Any area where soil is disturbed.

Additional Information

- Natural vegetation increases the filtering capacity because surface growth and root systems are usually dense in preserved natural vegetation.
- It provides areas for infiltration and "rougher" flow paths, thus reducing the quantity and velocity of stormwater runoff.
- It allows areas where wildlife can remain undisturbed or stressed.
- Tall and dense vegetation can provide noise buffers and screens for on-site operations/processes.
- It usually requires less maintenance than planting new vegetation.
- Geosynthetics include those materials that are designed as an impermeable barrier to contain or control large amounts of liquid or solid matter. Some geosynthetics have been developed primarily for use in landfills and surface impoundments, and the technology is well established. There are two general types of geosynthetics: geomembranes (impermeable) and geotextiles (permeable).
  - Geomembranes are composed of one of three types of impermeable materials: elastomers (rubbers), thermoplastics (plastics), or a combination of these two types of materials. The advantages of these materials include: 1) the variety of compounds available, 2) sheeting is produced in a factory environment, 3) polymeric membranes are flexible, and 4) simple installation. The disadvantages include: 1) chemical resistance must be determined for each application, 2) seaming systems may be a weak link in the system, and 3) many materials are subject to attack from biotic, mechanical, or environmental sources.
  - Geotextiles are uncoated synthetic textile products that are not watertight. They are composed of a variety of materials, most commonly polypropylene and polyester. Geotextiles serve five basic functions: 1) filtration, 2) drainage, 3) separation, 4) reinforcement, and 5) armoring.

Primary References

Caltrans Storm Water Quality Handbooks, Construction Contractor's Guide and Specifications, April 1997.

Subordinate References

Covers for Uncontrolled Hazardous Waste Sites, USEPA, EPA/540/2-85/002, PB87-119483, 1985.