



WWC's Helena, Montana office

## ***Erosion Control vs. Sediment Control - Understanding the Difference***

### **Erosion Control vs. Sediment Control**

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#### **Introduction**

Erosion Control and Sediment control are often misunderstood concepts. These controls are often necessary for construction projects to comply with current regulatory requirements. If your construction project will disturb 1-5 acres, considered small construction, or 5 or more acres, considered large construction, then a Storm Water Pollution and Prevention Plan (SWPPP) will be required for potential storm water discharges. This requirement was mandated in 1999 through the implementation of the National Pollutant Discharge Elimination System (NPDES) permitting process. A SWPPP requires you to develop a set of Best Management Practices (BMP) to provide Erosion and Sediment Control, which can be confusing. What are Erosion and Sediment Controls? Why are they necessary? Can you get away with just using one method or are both needed?

#### **Definitions**

By understanding the difference between erosion control and sediment control it will enable you to see the importance of each control measure. These terms are defined as follows:

**Erosion** – This is the detachment of soil particles from the ground surface by running water, wind, ice, or other geological agents. Erosion control methods protect the soil surface by stabilizing the soil.

**Sediment** - These are the particles of soils that have been detached. Erosion is the primary source of sediment. Sediment control methods trap the soil particles after they have dislodged and prevent or minimize their migration off-site.

As these definitions indicate, if the erosion process is controlled effectively, the need for sediment control is much less. In most cases, it is not possible to have one control method without the other, because both controls are dependant

on each other. Erosion Control practices help prevent soils from becoming detached from the soil structure. Sediment Controls aid in preventing the possibility of sediment bypass and the subsequent transport of sediment to downstream waterways, preventing potential water contamination.

#### **Types of Erosion**

There are two types of erosion to keep in mind when planning; the first being water erosion and the second wind erosion. Water erosion consists of six different types:

1. Splash – impact of rain on bare or sparsely vegetated soils,
2. Sheet – sheets of water that flow over soil surfaces,
3. Rill/Gully – water that runs over soil surfaces, accumulating in depressions until they fill up and form gullies,
4. Stream bank - sloughing of banks from rising and falling water levels and velocity induced impacts.
5. Shoreline – slough of banks into water by high energy waves, and
6. Snowmelt - large amounts of snow allowed to collect on disturbed areas where they freeze and detach soils. When soils thaw, the detached soils are transported downstream.

Wind Erosion, which usually happens over flat and poorly vegetated areas consists of three types:

1. Suspension – movement of very fine particles usually over long distances and at high altitudes,
2. Saltation – soil particles move horizontally across a surface bouncing into the surface and lifting other particles. These particles can

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cause damage to the surface and vegetation, and

3. Surface Creep – heavy particles roll across the soil after coming in contact with smaller particles that are moved by Saltation or Suspension.

#### Erosion Control Methods

It is best to address this issue at the planning stage. First, minimize soil disturbance by controlling erosion (minimizing disturbed areas, seeding, mulching, matting, etc.) Next, control the amount of soil runoff and stabilize the exposed soil. Erosion control should be the primary focus, as sediment controls are typically only 50% effective. With this in mind there are two types of erosion control methods. Stabilization Measures—cover or maintain existing cover over soil. These measures can be vegetative in nature such as planting shrubs, trees, or grass and non-vegetative such as installing geotextiles, riprap or gabions (wire mesh boxes filled with rocks). The other erosion control method is Structural Practices—these involve installing devices to divert, store, or limit runoff. These practices have several objectives: first to prevent water from flowing on disturbed areas by the use of dikes or temporary swales; the other is to cause sedimentation before the runoff leaves the site, by diverting flows to a trapping or storing area or filtering diffuse flows through on-site silt fences. All structural practices require proper maintenance to remain functional and should be designed to avoid safety hazards.

It is possible for control methods to overlap each other. For example, by preserving existing vegetation you will not only have soil stabilization but also erosion control; or by installing outlet protection/velocity dissipation devices you can create soil stabilization and maintain sediment control. It is

also possible for BMPs to provide both erosion control and sediment control. Placement has everything to do with the functionality of a BMP.

#### Sediment Control Methods

Sediment control methods are part of structural control practices that focus on channeling runoff to either trap the sediment or filter the sediment, limiting the discharge of pollution from the site. The following is a partial list of practices that can be used.

1. Earth Dike – a mound of stabilized soil used to divert uncontaminated runoff away from disturbed areas or divert contaminated water into a sediment trap or basin.
2. Silt Fence – posts with a filter fiber stretched across or along the down slope or side slope of a disturbed area. Runoff will filter through trapping the sediment on the uphill side.
3. Sediment Trap – excavation of a pond or placement of an earthen embankment across a low area of drainage, having an outlet or spillway made of large stones or aggregate. The trap will retain runoff long enough to allow the sediment to settle out.
4. Sediment Basin - a settling pond with a controlled water release structure which allows slow release of runoff and settlement of sediment.

In conclusion, the best defense is proper planning before project construction begins. Remember, BMP's are the first line of defense against erosion and sediment transport. For more information on this topic please feel free to contact WWC Engineering or check out the EPA website @ [www.epa.gov](http://www.epa.gov) under stormwater pollution, construction activities.