

Section 3

Best Management Practices

In order to address the requirements of pollution prevention at construction sites, a variety of techniques should be employed to reduce soil erosion, reduce site sediment loss, and manage some of the more common construction-generated wastes and construction related toxic materials. This section provides design criteria for a variety of techniques to address these issues. These BMPs consist of temporary methods to reduce pollution from a construction site. Hazardous and toxic wastes and construction-generated wastes will require coordination with multiple state and/or federal agencies, and the procedures and requirements for management of these wastes are not fully described in this document. Hazardous and toxic waste issues should be coordinated with EPA, MDT Environmental Services Bureau, and DEQ.

The BMP fact sheets listed in Section 3 were developed by the State of California Department of Transportation (Caltrans) and have been modified for Montana. The National Menu of Best Management Practices for Storm Water Phase II developed by EPA was used in Section 3 to verify that the BMPs listed in this section are consistent with EPA guidance. The majority of BMPs address soil loss from the site. For construction sites, soil loss in the form of erosion and sedimentation due to storm events, snowmelt, and wind constitute the majority of pollution generated. BMPs that address erosion and sediment control are typically more site specific than waste and toxics management. Erosion and sediment control BMPs are dependent on site slopes, drainage patterns, and drainage quantities along with other site-specific conditions. Waste management consists primarily of “good housekeeping” practices that are dependent on the type of construction, and the quantity and type of building materials.

In preparing the SWPPP, the designer can first use the BMP selection guide to determine BMPs applicable to the site. The fact sheets following the selection guide details the design requirements, maintenance requirements, limitations, and purpose of each of the techniques. In order to address the requirements of pollution reduction at MDT construction sites, a variety of techniques should be employed to reduce soil erosion and sedimentation.

3.1 Temporary Soil Stabilization BMPs

Temporary soil stabilization consists of preparing the soil surface and applying one of the BMPs shown in Table 3.1-1, or combination thereof, to disturbed soil surfaces. Temporary soil stabilization shall be applied to disturbed soils of construction projects in conformance with the MDT Standard Specifications and Section 5.2 - Erosion and Sediment Control Construction Process, of this manual. These BMPs are primarily used in perimeter areas around construction sites to either limit flows across the site or limit the erosion in areas disturbed, but not active.

Temporary concentrated flow conveyance controls, SS-9 through SS-11, are grouped with the temporary soil stabilization BMPs and consist of a system of BMPs that are used alone or in combination to intercept, divert, convey, and discharge concentrated flows with a minimum of soil erosion, both on site and downstream (off-site). Temporary concentrated flow conveyance controls may be required to direct run-on around or through the project in a non-erodible fashion.

Table 3.1-1 Temporary Soil Stabilization BMPs

ID	BMP Name	Primary Purpose
SS-1	Scheduling	Sequencing of BMPs
SS-2	Preservation of Existing Vegetation	Protection of desirable vegetation by limiting soil detachment
SS-3	Hydraulic Mulch	Protection of disturbed soil with mulch by limiting soil detachment
SS-4	Temporary Seeding	Provide soil protection through new plant growth
SS-5	Soil Binders	Soil stabilization for wind and water
SS-6	Straw Mulch	Protect disturbed soil with straw mulch by limiting soil detachment
SS-7	Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats	Protect disturbed soil or slopes
SS-8	Wood Mulching	Protect disturbed soil with wood mulch
SS-9	Earth Dikes/Drainage Swales & Lined Ditches	Intercept, divert, and convey surface run-on
SS-10	Outlet Protection/Velocity Dissipation Devices	Prevent scour of exiting storm water flows
SS-11	Slope Drains	Route overland flow into a pipe to protect slope
SS-12	Slope Roughening	Reduce runoff velocity, increase infiltration, trap sediments, and create microenvironment for seeding
SS-13	Terraced Slope	Reduce velocity and allow upland deposition
SS-14	Vegetated Buffer	Prevent soil erosion and catch sediment
SS-15	Erosion Seeding	Erosion control on steep slopes

3.2 Temporary Sediment Control BMPs

Construction activities normally result in soil disturbances on construction sites due to grading operations, clearing, and other activities. BMPs shall be installed to contain the detached sediments from being transported off site by using techniques like soil sedimentation and sediment trapping. Temporary sediment control practices shall be implemented in conformance with the criteria presented in Section 5 - Erosion and Sediment Control Construction Phase Process, of this manual. Temporary sediment control practices include the BMPs listed in Table 3.2-1.

Table 3.2-1 Temporary Sediment Control BMPs

ID	BMP Name	Primary Purpose
SC-1	Silt Fence	Slow and filter runoff to retain sediment
SC-2	Desilting Basin	Large pond with controlled outflow which allows sediment to settle out of runoff
SC-3	Sediment Trap	Reducing sediment before it enters live water bodies
SC-4	Check Dam	Provides minor detention and retention of sediment for small swales and concentrated flows
SC-5	Fiber Rolls	Intercept runoff and remove sediment
SC-6	Gravel Bag Berm	Intercept runoff and remove sediment
SC-7	Street Sweeping and Vacuuming	Prevent sediment from entering waterway
SC-8	Sandbag Barrier	Intercept runoff and remove sediment
SC-9	Straw Bale Barrier	Intercept runoff and remove sediment
SC-10	Storm Drain Inlet Protection	Intercept sediment at curb and field inlets. Should be used in conjunction with other on-site techniques.
SC-11	Dugout Ditch Basin	Provides minor detention and retention of sediment for small swales and concentrated flows

3.3 Wind Erosion Control BMPs

Wind erosion control consists of applying water or other dust palliatives as necessary to prevent or control dust nuisance. The wind erosion control BMP is shown in Table 3-3.1. Additionally, other BMPs sometimes used to reduce wind erosion are BMPs SS-3 through SS-7.

Table 3.3-1 Wind Erosion Control BMPs

ID	BMP Name	Primary Purpose
WE-1	Wind Erosion Control	Prevent or alleviate dust nuisance

3.4 Snow Accumulation and Snow Melt BMPs

Snow accumulation, icing, and snowmelt cause significant problems in Montana particularly in Montana’s upper mountain valleys. Heavy accumulation of snow in disturbed areas or poor snow removal practices can lead to severe erosion and sediment transport. In addition, freezing can cause BMPs to fail resulting in sediment discharge. Other soil stabilization and sediment control BMPs may also be effective. Snow accumulation and snow melt BMPs are shown in Table 3.4-1.

Table 3.4-1 Snow Accumulation and Snow Melt BMPs

ID	BMP Name	Primary Purpose
SN-1	Snow Management	Reduce the volume of runoff in disturbed areas
SN-2	Snow Accumulation	Reduce the volume of runoff in disturbed areas
SN-3	Freeze Reduction	Increase effectiveness of structures and BMPs

3.5 Tracking Control BMPs

Tracking control consists of preventing or reducing vehicle from tracking soil on the tires off site and consequently entering a storm drain or watercourse. Tracking control BMPs are shown in Table 3.5-1.

Table 3.5-1 Tracking Control BMPs

ID	BMP Name	Primary Purpose
TC-1	Stabilized Construction Entrance/Exit	Reduces offsite sediment tracking from trucks and construction equipment
TC-2	Stabilized Construction Roadway	Control of dust and erosion created by vehicular traffic
TC-3	Entrance/Outlet Tire Wash	Reduces offsite sediment tracking from trucks and construction equipment

3.6 Non-Storm Water Management BMPs

Non-storm water management BMPs are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come in contact with storm water. These practices involve day-to-day operations of the construction site and are usually under the control of the Contractor. These BMPs are also referred to as “good housekeeping practices,” which involve keeping a clean, orderly construction site. Table 3.6-1 lists the non-storm water management BMPs.

Table 3.6-1 Non-Storm Water Management BMPs

ID	BMP Name	Primary Purpose
NS-1	Water Conservation Practices	Conserving water on construction sites
NS-2	Dewatering Operations	Manage pollutants from dewatering operations
NS-3	Paving and Grinding Operations	Minimize pollution of storm water during paving operations
NS-4	Temporary Stream Crossing	Minimize pollution at waterway crossings
NS-5	Clear Water Diversion	Intercepts clear surface water runoff upstream of a project site
NS-6	Illicit Connection/Illegal Discharge Detection and Reporting	Recognize illicit connections or illegally dumped or discharged materials
NS-7	Potable Water/Irrigation	Reduce potential pollutants during discharge of water lines.
Vehicle and Equipment Operations		
NS-8	Vehicle and Equipment Cleaning	Procedures to minimize or eliminate discharge of pollutants from cleaning operations
NS-9	Vehicle and Equipment Fueling	Procedures to eliminate the discharge of fuel spills into waterways
NS-10	Vehicle and Equipment Maintenance	Procedures to eliminate the discharge of pollutants into waterways from maintenance activities

3.7 Waste Management and Materials Pollution Control BMPs

Waste management and materials pollution control BMPs, like non-storm water management BMPs, are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come in contact with storm water. These BMPs also involve day-to-day operations of the construction site and are under the control of the Contractor. They are additional “good housekeeping practices,” which involve keeping a clean, orderly construction site.

Materials pollution control (also called materials handling) consists of implementing procedural and structural BMPs for handling, storing, and using construction materials to prevent the release of those materials into storm water discharges. The objective is to reduce the opportunity for rainfall to come in contact with these materials. These controls shall be implemented for all applicable activities, material usage, and site conditions. Table 3.7-1 lists the waste management and materials pollution control BMPs.

Table 3.7-1 Waste Management and Materials Pollution Control BMPs

ID	BMP Name	Primary Purpose
WM-1	Material Delivery and Storage	Proper handling and storage of materials
WM-2	Material Use	Procedures for eliminating or reducing the discharge of materials to waterways
WM-3	Stockpile Management	Procedures for eliminating or reducing pollution of storm water from stockpiles
WM-4	Spill Prevention and Control	Prevent and control spills
WM-5	Solid Waste Management	Management of packaging, building materials, etc.
WM-6	Hazardous Waste Management	Management of paints, chemicals, fertilizer, pesticides, oil and grease, etc.
WM-7	Contaminated Soil Management	Procedures for eliminating or reducing pollution of storm water from contaminated soils
WM-8	Concrete Waste Management	Procedures for eliminating or reducing pollution of storm water from concrete wastes
WM-9	Sanitary/Septic Waste Management	Procedures for eliminating or reducing pollution of storm water from sanitary /septic wastes
WM-10	Liquid Waste Management	Procedures for eliminating or reducing pollution of storm water from liquid wastes

3.8 Best Management Practices Fact Sheets

The remainder of Section 3 provides fact sheets for each of the BMPs listed above. These BMPs constitute the tools available for transportation designers, contractors, construction managers, and maintenance personnel to utilize in the field to control erosion and sedimentation during construction activities.