

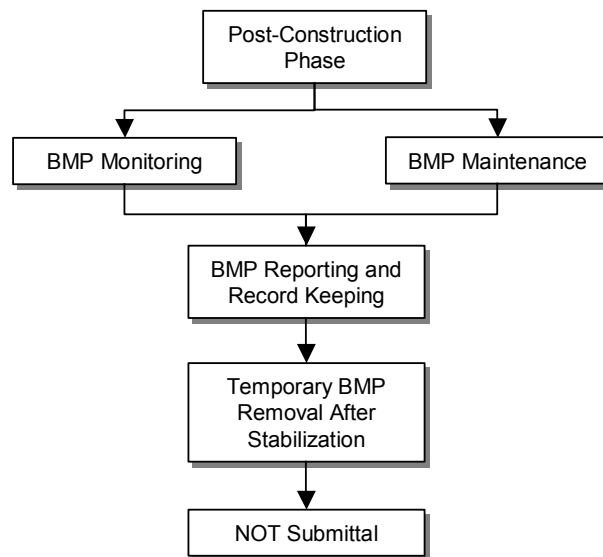
# Section 6

## Erosion and Sediment Control Post-Construction Phase Process

### 6.1 Overview of Erosion and Sediment Control Post-Construction

The post-construction phase of a project addresses monitoring, maintenance, and removal of temporary erosion and sediment control BMPs after construction activities are completed. During the post-construction phase of a project, the long-term maintenance of BMPs is performed and corrective measures are taken to ensure that the BMPs perform their intended objective of preventing erosion and sedimentation in areas disturbed during construction activities. Post-construction activities include, but are not limited to, monitoring BMP effectiveness, removal of excess sediment trapped by BMPs, monitoring and maintenance of revegetation areas, repair and replacement of damaged BMPs, and removal of BMPs that are no longer required. Failure to properly address the long-term reclamation and erosion and sediment controls of a disturbed site can result in years of environmental damage both on the site and downgradient of the site. Figure 6.1-1 provides a brief overview of the post-construction phase processes as it relates to erosion and sediment control.

**Figure 6.1-1 Erosion and Sediment Control Post-Construction Process**



#### 6.1.1 MDT Responsibilities

Following construction close-out, MDT becomes solely responsible for the project, unless maintenance agreements were made with Contractors or other outside organizations. At the project close-out, the project responsibilities are transferred from the Construction Bureau to the Maintenance Division. The Maintenance Division is now responsible for ensuring that all

post-construction BMPs are functioning properly, and that permanent and temporary BMPs are monitored and maintained to control erosion and sedimentation. The Maintenance Division is also required to submit a Notice of Termination (NOT) to the regulatory agency.

### **6.1.2 Contractor Responsibilities**

Once MDT has approved the project close-out, the Contractor has minimal, if any, responsibility for post-construction. The Contractor may be required by MDT to complete some tasks that were not completed during the project close-out. Additionally, the Contractor or another agency may be brought in to perform routine maintenance on post-construction BMPs. It is important that the Maintenance Division be involved with the final Contractor close-out inspections to ensure that all the repairs were completed prior to responsibility transfer to the Maintenance Division.

### **6.1.3 Regulatory Agencies Responsibilities**

DEQ is the primary regulatory agency involved with the post-construction phase monitoring of BMPs and the protection of surface waters from sedimentation and other pollution related to construction activities for sites not located on Tribal land. DEQ issues a NOT when a site is stabilized. Final stabilization of the site will be achieved when all soil disturbing activities at the site have been completed, and a vegetative cover has been established with a density of at least 70 percent of the pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. DEQ is responsible to provide site inspections during and after construction activities.

## **6.2 Erosion and Sediment Control Post-Construction Process**

The erosion and sediment control post-construction process consists of monitoring, maintenance, and removal of temporary post-construction BMPs. BMP monitoring and maintenance is a critical step in ensuring that activities completed during construction are not damaged or destroyed. This section of the manual will discuss the process of post-construction with regards to monitoring, maintenance, and removal of temporary BMPs.

### **6.2.1 BMP Monitoring**

Various methods can be utilized to monitor the effectiveness of temporary BMPs. Two common methods include water quality monitoring and hydraulic evaluation. In urban settings, where the likelihood of pollutants associated with sediment is higher than in non-urban areas, water quality sampling can be used to compare pollution loads. Influent pollutant concentrations can be compared with BMP effluent concentrations to determine if the BMP is being effective in the removal of contaminants. If pollutant concentrations are not reduced satisfactorily, a treatment BMP may need to be considered. Mining wastes may be encountered during construction activities in both urban and rural settings in Montana. These sites should be considered for water quality monitoring. Construction in areas containing petroleum or other contaminated soils must also be monitored carefully to ensure that pollutants are not exacerbated by the construction activities.

All BMPs should be evaluated for hydraulic performance. This evaluation should compare the intent of the BMP with how the BMP is performing in the field. For example, if a BMP is

designed to reduce velocity during a storm event, the evaluation should determine if the BMP has proven to be effective as constructed to intercept storm flows and reduce the velocity of the flow. A determination of the current status of this BMP also needs to be made. If the BMP was effective in reducing storm water velocities, an evaluation needs to be made to determine if the BMP is in proper working order to continue in this function during the next storm event, or to determine if maintenance is required to keep the BMP functional. Because the ultimate goal of the temporary BMPs is to protect the surface waters of Montana, an evaluation of the drainages, streams, wetlands, lakes, or other water bodies downstream of the construction site should be evaluated to determine if the BMPs are being effective at minimizing impacts to the downstream areas. This evaluation should include an assessment of any damage associated with an increase in velocity or volume of water downstream that was caused by the construction activities.

The MDT Maintenance Division shall perform BMP monitoring monthly and within 24 hours after storm event of 0.5 inches or greater. During the springtime, runoff site monitoring may need to be adjusted to daily on sites that have very low site vegetation reestablishment.

All monitoring results should be copied and sent to the Erosion and Sediment Control Section so that long-term evaluations of each BMP can be entered into the Department's database. This information will assist MDT personnel in determining which BMPs are most effective in different areas of the state.

During the monitoring phase, if a BMP is found to not to be functioning correctly, the Maintenance Division, or a Contractor, will be required to correct the problem as specified in Section 6.2.2 - BMP Maintenance.

### **6.2.2 BMP Maintenance**

The Maintenance Division or a Contractor shall perform BMP maintenance. The maintenance staff should correct minor maintenance issues encountered during the monitoring so that the BMP can immediately regain functionality. On larger maintenance issues, the Maintenance Division shall rectify the problem as soon as possible.

The AASHTO Highway Drainage Guidelines (AASHTO, 1999) include two basic BMP maintenance requirements:

- Frequent and periodic cleanout of accumulated sediment and;
- Replacement of deteriorated BMP materials.

As a guide, any temporary BMP (silt fences, sediment basins, and check dams) should be cleaned out when its accumulation capacity is approximately 50 percent filled. This judgment should be made considering the erodible nature of soil, velocity, and quantity of flow expected and history of accumulation of sediment (AASHTO, 1999).

BMP materials should be checked for deterioration. Silt fencing that has been in place for an extended period of time can be weakened and lose its ability to hold back sediment. Similarly, straw bails can deteriorate or become dislodged by animals or vehicles and may need replacement. If a BMP is consistently being replaced due to damage, an assessment should be

made as to whether a different BMP should be installed in its place or if additional upgradient measures need to be taken to reduce erosion from the site.

Access to BMPs needs to be maintained in order to properly maintain these structures. Special provisions may need to be made to provide wintertime access to temporary BMPs.

Maintaining BMPs during the winter months in Montana can be a nuisance and viewed as a costly measure; however, the overall control of snow melt events at a construction site can minimize or eliminate damage to downgradient areas and can save money in the long run as well as be more protective of the environment.

The maintenance guidance found for each temporary BMP in Section 3 is intended to help identify the measures required to properly maintain temporary BMPs and protect surface waters from erosion and sedimentation caused by construction activities.

### **6.2.3 Removal of Temporary BMPs**

The removal of temporary BMPs is driven by the evaluation of whether sufficient reestablishment of vegetation and other measures used to minimize erosion and sedimentation have been met on a construction site. Temporary BMPs may require removal in stages depending on their intended use. For example, silt fencing is designed to trap sediment caused by erosion within the construction area. Once a site is revegetated, the silt fencing should be considered for removal. If removals of BMPs are not planned, they tend to be forgotten or ignored. Once access to construction areas is lost, removing BMPs after they have been in place for a long period can cause additional damage. If long-term sediment control is desired on a construction site, silt fencing should be considered for removal during the monitoring and maintenance period and replaced with BMPs that are designed for the smaller sediment loads expected after the site is revegetated and can be left in place. For example, small check dams can be installed during silt fence removals that will continue to serve as sediment protection and will eventually become revegetated as they fill with sediment. Silt fencing left around inlet structures for a long period may actually divert water away from the drainage structure and cause flooding or erosion problems. If excessive sediment still exists for an extended time after construction activities are completed requiring silt fencing to remain, the upgradient erosion problem should be readdressed and remediated.

## **6.3 Erosion and Sediment Control Post-Construction Phase Tools**

This remaining portion of Section 6 provides checklists and reporting forms that the maintenance staff can use to monitor, maintain, and remove post-construction erosion and sediment BMPs.



### 6.3.2 Monitoring/Maintenance Checklist

Yes    No

Are BMPs accessible for monitoring and maintenance activities?

Is there evidence of excessive sediment loss or pollution from site?

Are slope stabilization BMPs effective in preventing excess erosion?

Are rills/gullies present on reclaimed slopes?

Do slope stabilization BMPs require maintenance to remove sediment?

Are additional or different BMPs required for slope stabilization?

Are sediment control BMPs effective in preventing excessive soil loss from site?

Is sediment laden water undercutting or bypassing BMPs?

Do sediment control BMPs require maintenance to remove sediment?

Are BMP materials in sufficient condition to work as designed?

Are any off-site conditions or activities negatively affecting on-site BMPs?

Is winterization of BMPs required?

Are wind control BMPs effective in reducing off-site dust?

Are there BMPs that can be removed?

Do sediment traps and desilting basins require sediment removal?

Have BMP monitoring report and maintenance forms been completed for each BMP?

Have maintenance follow-up action items been recorded?







### 6.3.5 BMP Removal Checklist

Yes    No

Is site vegetation of adequate species and density (as specified by MDT Agronomist) to maintain soil stabilization?

Have any rills or gullies formed on reclaimed slopes since last monitoring event?

Is sediment still accumulating behind BMPs?

Are permanent BMPs (if any) functioning properly?

Can BMPs that are designed to collect small volumes of sediment be used in replacement of larger, more intrusive BMPs (e.g. replace silt fence with check dam)?