Aggregate Operators Best Management Practices Handbook

PART II

Chapter 5 - 9: Planning Modules
BMP MONITORING MODULE - BMM

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BMP Monitoring Module - BMM

Who Needs a BMP Monitoring Plan

Best Management Practices (BMPs) require skillful installation, application and maintenance to be effective. Once implemented, they require monitoring to ensure that they are achieving the objectives for which they were selected.

Using BMPs does not exonerate an operator from permit requirements or from complying with other legal requirements. The BMPs described in this handbook are intended to assist in meeting or exceeding permit requirements and controlling social and environmental impacts. Monitoring the success of BMPs, whether they are structures like a check dam or procedures like limiting drop height, will help assure compliance with legal requirements.

What is BMP Monitoring

Monitoring BMPs typically involves inspecting the results or performance of the practice. To illustrate, a bent nail will quickly tell you if a hammer is not working properly, whether the alignment was off, the sizing of the hammer was incorrect or a knot was hit. Monitoring can assist with focusing alignment and sizing and accounting for the unknown so that the next nail goes in straight.

BMP monitoring also involves scheduling of inspections to ensure that the outcomes of BMPs meet expectations. At the heart of BMP effectiveness monitoring is a listing of each BMP, its expected performance and an assessment of whether the controlled value (noise, dust, water quality, etc.) is within targeted limits. Table BMM - 3 provides an example of how to organize that information and can be adapted by operators to meet their specific needs. Table BMM - 3 groups BMPs by control categories, such as "Dust Control", but operators should feel free to group BMPs by any other category (see Table BMM-1 for suitable examples).

Table BMM - 1: Sample inspection category options for BMP monitoring

Inspection Category	Examples
Frequency	• daily • weekly • monthly • bi-annual
Area	• stockpiling area • extraction area • processing area • reclaimed area
Event	• when production volume threshold reached • after a large storm • dry conditions (according to local forestry district fire hazard rating) • air quality event (perhaps as published in local news paper)

Collecting the Information

Monitoring involves collecting and assessing information. Some factors to consider in determining how to best do that include:

1. **Find a Method that Works for the Operation:**

   What works for one operation may not work for another of a different size, location or product line. Companies also have a culture or "way of doing what they do". Collect BMP effectiveness information in a way that works for the operation.

2. **Fit Monitoring to the Monitor:**

   The type of person inspecting the BMPs will determine how foolproof the monitoring form or schedule should be. An employee who has never seen a check dam before should be asked much more explicit questions than someone with technical training. The technically trained may be simply asked, "Is it O.K?" while the untrained should be asked questions like, "Are there signs of erosion of the soil by water or is sediment collecting within 30 cm of the top of the check dam?"

3. **Type of Information Required:**

   For information that doesn't require a number or value, such as simple binary data (e.g., whether traffic speed is generating dust), subjective monitoring could be done by most competent employees. For information such as turbidity of discharge, specific instructions, equipment or training may be required for effective monitoring.

The information can be recorded free-form in a notebook, binder or clipboard or on prepared forms. On a prepared form, information queries can be asked in a number of ways. See Table BMM - 2 for illustration.

Table BMM - 2: Options for collecting monitoring information on dust plumes from traffic

Query Style	Example: Speed Reduction to limit dust created by haul trucks.
Free form	_____ (blank note book)
Fill in the blanks	Dust plumes ___(describe any dust plumes)___
Yes/No questions	Dust plumes: yes/no
Check boxes	Dust Plumes: ☐ Large Plume (greater than the size of the truck) ☐ Moderate Plume (same size as the truck) ☐ Small Plume (smaller than half the size of the truck) ☐ No Plume (smaller than half height of the tires)
Data	HiVol. Sample results Dust Fall Sample results

Table BMM - 3: Sample BMP effectiveness monitoring tracking sheet

Inspector	*ABC GRAVEL*		Weekly BMP	Monitoring	Report		No.: Date:
BMP	**I.D.**	**Location (s)**	**Control Objectives**	**Maintenance required**	**Failure indicators**	**Met Control Target**	**Notes**
				ref. BMP 4 Schedule			
Stormwater Control							
Checkdam	CD01	Ditch # 8	• to control flows • prevent erosion • trap sediment	ⓑ clean out ⓑ depth of sediment ___ cm.	ⓑ erosion around top ⓑ erosion in ditch line ⓑ downstream scour pool ⓑ	**Stormwater** ⓑ turbidity, ⓑ TSS	ⓑ
Checkdam	CD02	Ditch # 4	• to control flows • prevent erosion • trap sediment	ⓑ clean out ⓑ depth of sediment ___ cm.	ⓑ erosion around top ⓑ erosion in ditch line ⓑ downstream scour pool ⓑ	**Stormwater** ⓑ turbidity, ⓑ TSS	ⓑ
Settling Pond	SP01	End Ditch #8	• decant storm water	ⓑ clean out ⓑ depth of sediment ___ cm.	ⓑ piping ⓑ use of overflow	**Stormwater** ⓑ turbidity, ⓑ TSS	ⓑ
Drop Height	DH01	Face Loader Operations	• reduce dust	n/a	ⓑ dust complaints ⓑ dusty perimeter trees	**Air quality** ⓑ air quality	ⓑ
Drop Height	DH02	Trucks into Crusher #1	• reduce dust	n/a	ⓑ dust complaints ⓑ dusty perimeter trees	**Air quality** ⓑ air quality	ⓑ
Telescoping Chute	TC01	Stockpile Conveyor	• reduce dust	ⓑ check for rips	ⓑ dust complaints ⓑ dusty perimeter trees	**Air quality** ⓑ air quality	ⓑ
Perimeter Trees		Perimeter	• intercept dust	ⓑ clean	ⓑ dust complaints	**Air quality** ⓑ air quality	ⓑ

When to Monitor

Schedules for BMP effectiveness monitoring will be determined by the nature of the BMP itself and by the consequences of failure.   Treed berms, for example, would not have the same inspection schedule as settling ponds. Certain BMPs have only a seasonal significance or are tasks performed only one or two days a year. Monitoring of stormwater BMP's, for example, should be intensive for the 18 hours it takes for a 200-year storm to blow through, but could be reduced during the dry season. Thus, a practical solution would be to have a regular schedule, such as monthly in the dry season and weekly in the wet season, but with the ability to add extra monitoring in response to identified events, such as peak flows during major storms.

Monitoring can generally be completed during the facility's normal working hours and while processing is at normal levels, noting certain exceptions as illustrated above.

Setting up a Monitoring Program

Table BMM - 4 lists some key steps in establishing a BMP effectiveness monitoring program.

Table BMM - 4: Key steps to establishing a BMP effectiveness monitoring program

Steps	Step Details
1. Set Up	- list and identify location of BMPs - list activities & site features - create monitoring map to assist in planning and organizing BMP monitoring - identify parameters to be monitored - establish a standard procedure or routine - train the persons monitoring
2. Monitor	- begin BMP effectiveness monitoring schedule - evaluate monitoring
3. Make Changes	- make changes to BMPs or select other BMPs where goals are not met - make changes to monitoring program if it is not providing useful information