

Chapter 6: Strategy for Success

On the Path to Implementation

Introduction

6.1 BMP Feasibility

6.2 Developing a Plan of Action

6.3 Finding the Resources

Active Options

Write It down

This chapter will help you:

- Understand the critical connection between BMPs and water quality
- Select BMPs based on realistic factors in your watershed
- Organize a detailed plan of action

As in every chapter, this one also provides:

- Active Options
- Write it down

Find related information about this stage of watershed planning in Chapters 11 and 12 of EPA's Handbook

Introduction

By this point in the planning process, you know a lot about water quality and the Best Management Practices (BMPs) used to address issues with water quality. The overall intent of this chapter is to distill those BMPs down to a realistic plan to improve water quality in your waterway and then calculate pollutant load reductions expected for the selected BMPs. Each BMP needs to be tied to reducing the pollutant loading of your stream. This takes planning and attention to detail, but you have the tools you need. As your planning team goes through the process of selecting BMPs and the action items to get the BMPs done, it will be important to keep stakeholders involved.

6.1 BMP Feasibility

In the preceding chapters, you figured out what's happening in your watershed and the BMPs that may be able to address the issues. Now you must look over your list of potential BMPs and decide which ones are realistic for your watershed and your watershed planning team. There are many factors to consider. It may be the case, for example, that a particular BMP would result in the greatest water quality improvement, but it's unlikely the landowners could participate or the cost is too high. In that case, a different BMP would be a better fit. Now is the time to think about all the external forces at play in your community and the feasibility of establishing certain BMPs.

6.1.1 Feasibility Factors

In Chapter 5, you developed a list of BMPs to address the sources and pollutant contributors within the Phase 2 sub-watersheds. This list also included BMPs to protect the catchments with good water quality. Now you need to examine your list

and see if your initial priorities for implementation can actually be accomplished. This involves looking at a variety of feasibility factors. The following factors should be considered. These are similar to the feasibility factors that you used in Chapter 4 to select your Phase 2 sub-watersheds, but now you are applying them on a different scale to determine your plan of action.

- **Regulatory matters** – Some watershed issues may be beyond the scope of what your BMPs can address. Does your planning team have the capacity to address the issue or is it a regulatory enforcement issue? Keep in mind that your BMP strategy should be comprehensive, but you do not want to duplicate efforts. If your issue is being addressed through an existing regulatory action then your planning team may decide to pursue the issue through a different forum. For example, if the Kentucky Division of Water (KDOW) is pushing the local wastewater treatment system to make some improvements that would address your concerns, can you help boost local support for a needed improvement to the wastewater treatment system?
- **Stakeholder cooperation** – Successful implementation requires support from local stakeholders. It is important to look at the sub-watershed, along with the sub-watershed information you gathered and pollutant loads, and consider stakeholder support for your goals for protection or restoration. For example, if an implementation goal involved stream restoration, would the local landowners be more supportive in one particular catchment within the sub-watershed? Sometimes it is also important to consider local demographics. Will a rain garden be successful over the long run in an area populated mostly by college students?
- **Political will** – Successful implementation requires support from local officials. It is important to look at the sub-watersheds, along with the watershed information and pollutant loads, and consider the political will of accomplishing your goals for protection or restoration. For example, if an implementation goal involved changing or creating a local ordinance, would local officials be more supportive in one particular catchment within the sub-watershed? If local officials are adamantly against changing or creating an ordinance, your initial goal may need to be a focused plan of outreach and education to the officials and their voting constituency to make them aware of the need for the ordinance. Perhaps this feasibility factor will not be as relevant at this Phase 2 scale, but it should be considered if it applies to your sub-watershed.
- **Available funding** – Financial resources are critical to success in your watershed and must be considered when prioritizing BMPs. For example, are there particular BMPs in which you may be able to garner more funds than the others? Also, it may be the case that your planning team only has the resources for educational or non-structural BMPs. These BMPs are still valuable and can be your focus as you search for funding for other BMPs!
- **Cost-benefit analysis** – Often there will be more than one BMP that can address the pollutant of concern. There are several processes that may be used to rank their cost-effectiveness. One approach would be to score each BMP according to the criteria your planning team has established as critical (like some of the

factors in this very feasibility factors list) and arrive at a total score by averaging or summing the factor scores. This may be an exercise that your watershed planning team can do together.

- Areas of local concern – There may be issues or locations throughout your sub-watershed that are important to local stakeholders. For example, are there catchments within the sub-watershed that are special to the community and merit protection, like a swimming hole or a historic location? Or is there an area of particular concern for the community even though it may not be an area of significant pollution?
- Existing priority status – Past work may have led to additional resources being spent or allocated in your sub-watershed. For example, are there particular catchments within the sub-watershed in which partners are already working or have federal, state, or local priority status?
- Watershed Management Activities – The information regarding Source Water Protection Plans, Groundwater Protection Plans, Wellhead Protection Areas, past and current watershed plans, wastewater authorities, Agricultural Water Quality Plans, and special land use planning that was discussed in Chapter 5 should also be utilized in the prioritization. For example, if there is a particular catchment within the sub-watershed that is in a Wellhead Protection Area it may be more likely to gain local support in that watershed.

6.2 Developing a Plan of Action

Now that you have studied the possible BMPs and selected ones that are most appropriate for your project, in your sub-watershed, you must develop a plan of action. There are many good ways to do this, but certain elements will need to be present regardless of chosen style and organization. For each BMP selected, Action Items should be developed. Action Items will fill in the details of each BMP.

The process of **prioritizing your BMPs** will benefit from the involvement of your technical team, who should be familiar with the range of practices that are appropriate for your objectives and are likely to help you reach your target values. It will also benefit from the participation of partners who administer BMP programs in Kentucky, such as the NRCS or the Division of Forestry.

6.2.1 Developing Action Items

Action items are the real-world steps your planning team will take to get each best management practice up and running. They are the steps needed to encourage, plan, install, maintain, and monitor the success of BMPs and water quality improvements. There may be multiple action items necessary to implement one best management practice. In developing action items, it may be helpful to start with the watershed planning team's initial concerns. Using those concerns and what you have learned, work out long-term goals that ultimately address those concerns in the context of

water quality improvements. For each Action Item, it will be necessary to discern the following details:

- Responsible Party – Identify the person or organization responsible for carrying out each action item. This may be one of your partners or someone outside your group.
- Technical Assistance – Identify who will be providing the specialized scientific and technical knowledge to support effective implementation of action item.
- Total Cost – Estimate the cost of the action item.
- Funding Mechanism – Identify the funding mechanism for the action item including concrete amounts already established as well as potential sources and in-kind assistance.
- Location of BMP – Identify the area within the sub-watershed where the BMP will be implemented.
- Pollutant or Measureable Parameter – The pollutant or measurable parameter addressed by the BMP was determined in Chapter 5. Many BMPs will address multiple pollutants or parameters. You should include all of these.
- Target value – The target value is the in-stream benchmark for the pollutant or measurable parameter. This was established in Chapter 4, Section 4.2.3.
- Target load reduction – The target load reduction needed for the pollutant or measurable parameter was also established in Chapter 4, Section 4.2.3. Remember to use the target reduction needed for the catchment where the BMP will be implemented.
- Estimated load reduction – The estimated load reduction expected from the BMP can be determined in a number of ways. Section 11.3 of the EPA Watershed Planning Handbook provides numerous methods for completing this task. Keep in mind that certain BMPs, especially non-structural BMPs, may not have specific load reductions. This does not make these BMPs any less valuable. For example, your Action Plan includes landowner education for septic system maintenance. This Action Item addresses *E. coli*, but you will not have a load reduction estimate for this particular BMP.
- Milestones – short-term (less than one year), mid-term (1-3 years), long-term (3+ years), and extended (20+ years with following-up monitoring).

There may be additional information that your planning team wants to add. The idea is to iron out all the details in advance so that once implementation begins, most of the planning work is finished – until it's time to reevaluate and revise.

The action item details can be cumbersome to organize. One watershed group in Kentucky, the Muddy Creek Watershed Team, took the approach of breaking the information up into a series of tables that illustrate the process the group went through to flesh out all the detail needed. They found the process of making these tables a good way to organize their information and intentions. Look at each table (below) and see what details were added each time. Notice, too, that they started out on a broad, watershed level, but eventually worked their way down to the sub-watershed level for detailed planning. Your planning team will need to decide the best method for your project.

6.2.2 Plan Examples

The Muddy Creek Team used this first table to organize their original concerns, the specific water quality issues to be addressed, and target values for indicators ('indicator' is used in the tables to mean water quality issue). See Table 6.1.

Concerns	Source/Cause/Pollutant	Indicators	Priorities
Decrease the sediment loads in Muddy Creek	<p>Runoff from disturbed land: sediment input can fill in the creeks causing water to more rapidly overflow banks. Sediment loads also negatively impact water temperature, nutrient concentrations, and aquatic habitat.</p> <p>Removal of stream bank vegetation: the removal of vegetation from the bank allows for sediment to easily erode.</p>	<ul style="list-style-type: none"> • Bank measurements • Visual observations • TSS • Water temperature • Land cover • Nutrient concentrations • Conductivity • pH • Alkalinity 	<p>Reduce sediment loss from runoff associated with vegetation disturbances and construction</p> <p>Increase stream bank and riparian zone vegetation</p> <p>Stabilize stream banks</p> <p>Educate public</p>
Decrease bacteria levels to meet Primary Contact standards	<p>Residential inputs: failed septic systems increase bacteria entering our waterways.</p> <p>Runoff from livestock operations: bacteria levels increase without proper buffer zones and creek fencing.</p>	<ul style="list-style-type: none"> • Bacteria counts • Nutrients • Visual survey 	<p>Reduce bacteria loads from failed/failing septic systems and livestock operations</p> <p>Educate home and land owners</p>

Table 6.1 Muddy Creek Watershed Concerns and Priorities

The Muddy Creek planning team then narrowed their focus to a sub-watershed (Amanda's Branch) for the second table. They also created similar tables for each of the other sub-watersheds. This allowed them to address water quality issues more specifically. Table 6.2 follows concerns through to related Indicators and their Target Values. Note that this table does not yet include Action Items. It does include the Target Value. The target value is the level or amount of a particular indicator that is desirable. Depending on the indicator in question, a lower or higher target value would be better. For example, the *E. coli* level would ideally be even lower than the target value of 130 cfu/mL while the Habitat Assessment would ideally be higher than 130.

Concerns	Priorities	Indicator	Target Value	Basis
Decrease the sediment loads in Muddy Creek	Increase stream bank and riparian zone vegetation	TSS	3.39 mg/L	Reference data
		Habitat Assessment	130	Literature values
	Stabilize stream banks Educate public	Biological Assessment (volunteer form)	Score of "Good"	Literature values
Decrease bacteria levels to meet Primary Contact standards	Reduce bacteria loads from failed/failing septic systems Educate home and land owners	Bacteria Count	Monthly geometric range of 130 cfu/100 mL or 240 cfu/100 mL or greater in no more than 20% of samples	WQ Standards

Table 6.2 Relationship of Concerns to Target Values in the Amanda’s Branch sub-watershed.

For Table 6.3, the Muddy Creek planning team added their Action Items. Action Items are organized here by the associated BMP. To address each of their concerns, there are multiple BMPs, and for each BMP, there are multiple Action Items.

Concerns	Priorities	BMP	Action Items	
Decrease the sediment loads in Muddy Creek	Increase stream bank and riparian zone vegetation	Place vegetated buffer strips along the main stream channel	<ol style="list-style-type: none"> 1. Secure local cost share money to do on-ground demonstration. 2. Obtain funding for local landowners to implement. 3. Develop a workshop to be held for landowners. 4. Provide monitoring information with local and state agencies. 5. Work with local agencies to provide education opportunities for landowners. 	
		Stabilize stream banks		Enforce current laws and regulations
	Educate public	Education		
Decrease bacteria levels to meet Primary Contact standards	Reduce bacteria loads from failed/failing septic systems	Upgrade Septic Systems		<ol style="list-style-type: none"> 1. Work with County Health Department to provide assistance. 2. Help qualifying homeowners with grant programs. 3. Provide monitoring information with local and state agencies. 4. Work with local agencies to provide education opportunities for landowners.
		Enforce current laws and regulations		
	Educate home and land owners	Education		

Table 6.3 Summary of Action items for BMPs in Amanda’s Branch sub-watershed.

Pollutant Load columns have been added here. Tying pollutant loads to BMPs is a critical step in the watershed planning process and important to map out for each sub-watershed. For example, if the septic systems in Amanda’s Branch sub-watershed are upgraded as planned, how much bacteria reduction can be expected? In Table

6.4 below, note that the reduction in bacteria needed is 67%, but the “Upgrade Septic Systems” BMP is only expected to reduce the pollutant load by 50%. In this case, there are additional BMPs that will contribute to the reduction of the load so this one doesn’t have to reduce the entire load itself.

BMP	Action Items	Indicator	Target Value	Target Load Reduction Needed	Estimated Load Reduction Expected
Upgrade Septic Systems	1. Work with County Health Department to provide assistance. 2. Help qualifying homeowners with grant programs. 3. Provide monitoring information with local and state agencies.	Bacteria Count	Monthly geometric range of 130 cfu/100 mL or 240 cfu/100 mL or greater in no more than 20% of samples	67%	50%

Table 6.4 Target Load Reductions and Estimated Load Reductions for the Amanda’s Branch sub-watershed.

And finally, Muddy Creek’s Table 6.5 gets down to the nitty-gritty planning of each BMP and associated Action Item. You may not know all the details at first, but it is important to take time to figure them out. It would also be helpful to address milestone goals for short-term (less than one year), mid-term (1-3 years), long-term (3+ years), and extended (20+ years with following-up monitoring) items.

BMP	Responsible Party	Technical Assistance	Cost	Funding Mechanisms
Place vegetated buffer strips along the main stream channel	Landowner	NRCS Fish and Wildlife KY Department of Fish and Wildlife Resources (KDFWR)	\$1,500 per mile ~\$9,000 for the entire main stem of Muddy Creek	319 (h) grant NRCS cost share programs KDFWR cost share programs
Upgrade Septic Systems	Landowner Health Department	Health Department	\$3,000 - \$10,000 per house	East KY PRIDE

Table 6.5 Summary of Action items details for BMPs in Amanda’s Branch sub-watershed.

Another watershed group in Kentucky took a different approach. One way to handle the planning and illustration of that planning is through an interpretive map. The Clarks Run watershed group, created a pollutant load reduction map (see Figure 6.1) that is a great example of a more visually-oriented way of presenting information.

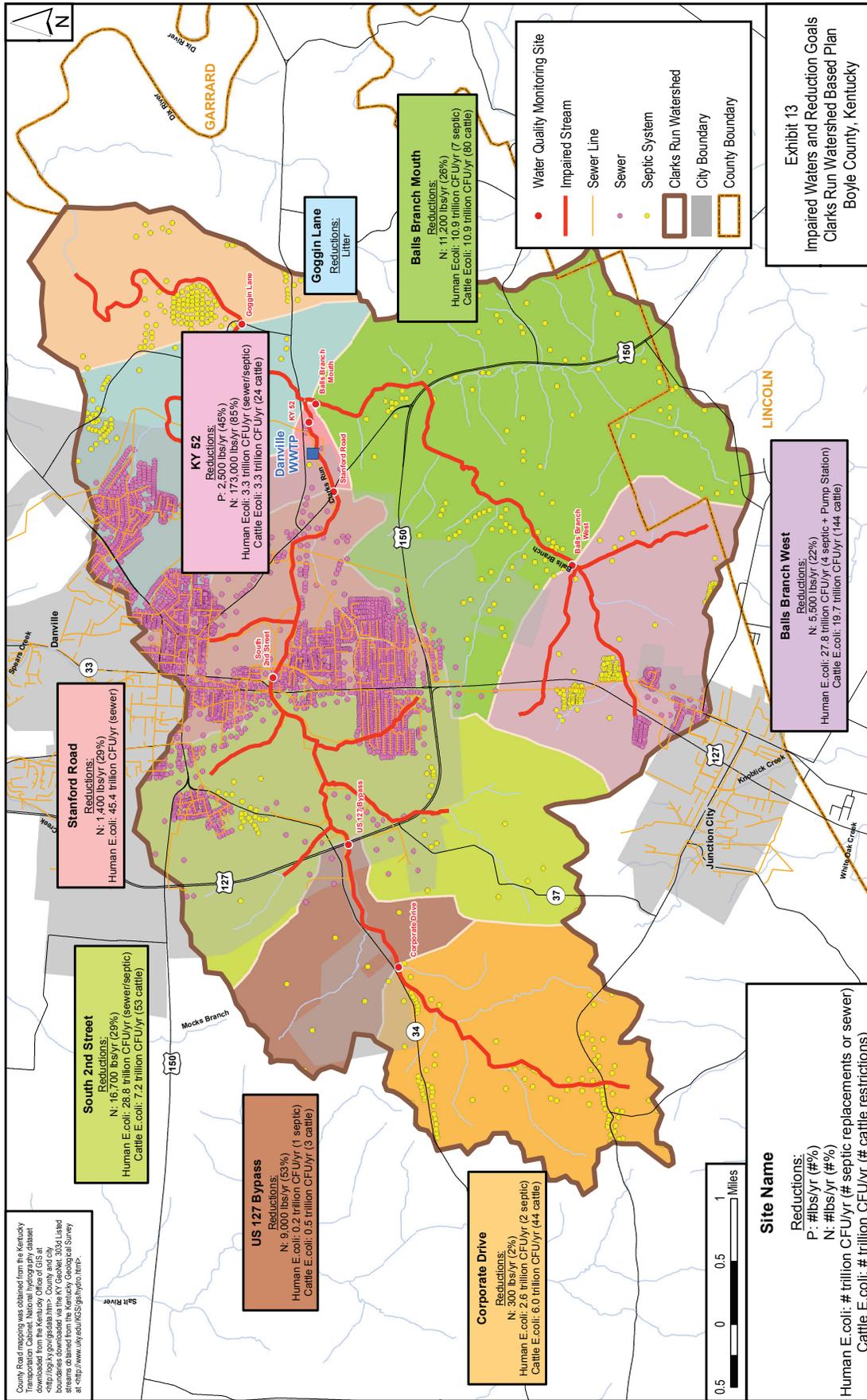


FIGURE 6.1 - Clarks Run Pollutant Load Reduction Map

6.3 Finding the Resources

Finding a single funding source for your watershed plan would be unusual and probably unwise. Your plan has been developed using a collaborative process that has brought together partners and stakeholders who have significant resources and direct interests in the health of the watershed. Many of them administer programs that influence watershed or waterway health. Others have technical expertise that is within their mission to share in watershed planning activities, and still others have political or moral influence over groups of stakeholders in your community whose changed behavior can positively affect your waterway's health. In many cases, resources will need to be identified for each best management practice in your action items.

6.3.1 Potential Resources

NRCS Resources

The Natural Resources Conservation Service (NRCS) is a federal agency that provides assistance to local farmers and landowners to help them manage their land, through conservation programs and with technical information.

One such program is the Conservation Reserve Program (CRP), which provides technical and financial assistance to eligible farmers to address soil and water issues on their lands through policies that are cost-effective for the landowner and environmentally friendly. Implementation of the CRP program helps to reduce soil erosion and sedimentation in streams and lakes through native plantings or the establishment of riparian buffers. These practices improve water quality; enhance or create wildlife, forest, and wetland habitat; and encourage farmers to plant vegetative cover, (native grasses, trees, and shrubs) and riparian buffers on highly erodible cropland to decrease sediment erosion. Farmers who sign up for multi-year conservation easement contracts with the NRCS are paid annual rental rates for their contracted acreage, plus cost sharing opportunities for approved vegetative cover practices.

Another NRCS program, Conservation of Private Grazing Land (CPGL), offers technical assistance to farmers and landowners for better land management, preserving water quality, decreasing soil erosion, and providing wildlife habitat. Where runoff of bacteria sources – such as cattle in streams and manure applications – is a main impairment to streams, the NRCS offers technical assistance in many areas. These include manure and feedlot management, nutrient management planning and agricultural programs.

Information regarding these and other NRCS programs can be found on their website .

319 Nonpoint Source Funds

For other strategies, no funding source may be available. In these cases, the sponsor or an eligible partner may apply to the Kentucky Division of Water for 319 program funds. Chances are if you are preparing this watershed plan, you're very aware of the requirements of the program!

Don't be daunted!

The overall goal of this part of the planning process - identifying the needed solutions to your water quality problems - is not to scare you or your stakeholders. From a planning perspective, it's important to know whether or not you'll be able to deal with your problems in one year or five or twenty-five. If you're facing some significant challenges, your group will need to know that an effort is needed over the long haul, and that results might not be evident for several years.

The 319 program requires significant local match of the federal funds that may be awarded. Fortunately, two important resources of your planning team are available as match:

- The value of the time the members of your planning team spend on its activities; and
- The value of the action items undertaken by planning team partners.

Kentucky EXCEL

A program of the Kentucky Environmental and Public Protection Cabinet, "Excellence in Environmental Leadership" ("EXCEL"), provides incentives for environmentally-regulated businesses to assist with watershed and other initiatives. In your community, there may be businesses participating in this program, and they are looking for partners just like your watershed planning team. More information is available at the EXCEL program's website .

To learn more about the 319 program, call the program staff at 502-564-3410 or visit their website .

In-Lieu Fee Program for Stream and Wetland Mitigation

The Kentucky Department of Fish and Wildlife administers the In-Lieu Fee Program for Stream and Wetland Mitigation Program. This program uses funds collected from mining or other activities that alter streams to finance stream or wetland restoration and enhancement projects, to compensate for the loss of aquatic habitat. The scope of stream mitigation can vary from something as simple as planting a riparian area along a stream to projects as complicated as full-scale reconstruction of the channel. Contact the Kentucky Dept. of Fish & Wildlife Resource at 502-564-5448 for more information.

Kentucky Transportation Cabinet

The Kentucky Transportation Cabinet, Division of Environmental Analysis administers another stream and wetland mitigation program. If there are transportation projects in your area, funds may be available for stream and wetland restoration and enhancement projects. For additional information contact the Bio-engineering branch at 502-564-7250 or visit their website .



Active Options

- Conduct a Stream Walk with help from local experts on plants and animals and area history
- Organize a “BMP Dessert Night” to connect with local residents and business people and get their ideas on BMP Feasibility
- Take a field trip to a nearby green infrastructure site to learn more cost, maintenance, and community support
- Invite a guest speaker (for example a green infrastructure company or a Kentucky Onsite Wastewater Association representative) to talk to your planning team
- Host a public awards ceremony to highlight exemplary practices in your target audience, for example a farmer or volunteer tree-planting project.

For more funding ideas for implementing your watershed plan, go to [www.kywater.org](#) and EPA’s website [www.epa.gov](#).



Write It Down

Implementation Strategy Planning

BMP Feasibility

Feasibility - record the factors at play in your watershed and the choices you made about BMPs.

BMPs and Action Items

In some manner (a table, chart, narrative, etc.), record all necessary information about the BMPs selected. If most of the information is going into a table, it may still be helpful to have some explanatory narrative.

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