

Section 2

Stormwater Pollution Prevention Planning for Municipal Operations

2.1 Introduction

As noted in Section 1 municipalities are required to develop and implement a comprehensive stormwater management program including the reduction of pollutants from municipal operations. In this section, a planning process is suggested for municipal operations, which allows the municipality to identify the activities that generate pollutants and the best management practices (BMPs) applicable to the activities. The recommended process includes the following key components:

- **Inventory:** First, an inventory is developed of all municipal facilities and activities that may be a source of pollutants in stormwater (Section 2.2).
- **Assessment:** Next, the activities are evaluated for their potential to discharge pollutants to storm drains and/or to receiving waters (Section 2.3).
- **BMP Selection:** BMPs are then selected to deal with the identified sources of stormwater pollution. Emphasis is placed on source control (procedures) BMPs and proper maintenance of treatment control BMPs (Section 2.4 and Sections 3 and 4).
- **Implementation:** BMPs are implemented and their effectiveness evaluated. The monitoring, reporting, and inspection requirements of the BMPs is oriented toward gaining insight into the performance of the BMPs (Section 5).

It is worth noting that some municipal facilities may be classified as an industrial-type facility subject to the State NPDES General Permit for Industrial Activities. The reader is referred to the Industrial and Commercial BMP Handbook to determine the classification of the municipal facility. If classified as an industrial facility then the reader should use the Industrial and Commercial BMP Handbook. For all other municipal facilities, the planning procedure described here is applicable.

2.2 Develop Inventory of Public Agency Activities

This section describes steps that may be used to generate and maintain comprehensive inventories of the pollutant generating activities associated with municipal operations. These activities can be categorized into two groups as described below:

- **Fixed Facilities** – specific locations municipalities own and operate and at which municipal activities occur. These types of facilities may also be municipally owned but privately leased. Examples of fixed facility types include municipal waste facilities and corporation yards.
- **Field Programs** - a set of related municipal activities that take place throughout the municipality. These types of activities may also be privately contracted. Examples of

municipal field programs include roads, streets, and highways maintenance, and drainage system operation and maintenance.

The flow chart presented in Figure 2-1 illustrates the two steps involved in compiling the inventories for both fixed facilities and field programs. A summary of the information that is collected as part of inventory is provided in Table 2-1. Sections 2.2.1 and 2.2.2 provide the guidelines for fully completing the inventories.

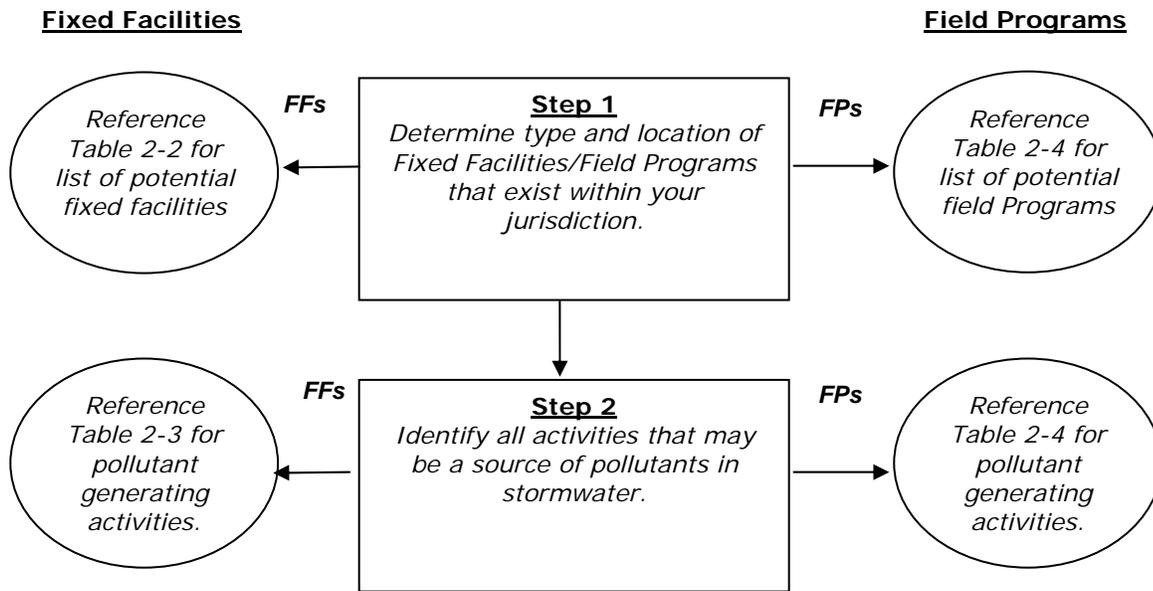


Figure 2-1
Inventory Process for Fixed Facilities and Field Programs

Table 2-1 Inventory Information

<p>Fixed Facility <i>Facility Type and Location (Step 1)</i></p> <ul style="list-style-type: none">■ <i>Facility name/type of facility</i>■ <i>Sub-category facility type (see Table 2-2)</i>■ <i>Physical Address Information</i>■ <i>Watershed and nearby water bodies</i>■ <i>GIS Information (longitude and latitude, etc.)</i>■ <i>Site Map</i> <p style="text-align: center;"><i>Facilities Activities and Pollutants (Step 2)</i></p> <ul style="list-style-type: none">■ <i>Facility Activities</i>■ <i>Potential Pollutants (See Table 2-3)</i>■ <i>Pollutants of concern into a 303(d) listed water body or other ESA</i>■ <i>List of past significant spills and leaks</i>■ <i>List of significant materials and chemicals</i>■ <i>Potential non-stormwater discharges</i> <p style="text-align: center;">Field Program <i>Program Type and Location (Step 1)</i></p> <ul style="list-style-type: none">■ <i>Program type</i>■ <i>Name and contact information of contractor (if work is contracted out)</i>■ <i>Area of coverage</i>■ <i>Watershed(s) within coverage area (hydrologic units)</i>■ <i>Description of drainage facilities (number, size, length of open channels and closed conduits)</i>■ <i>Adjacent to and/or discharge to 303(d) listed water body or other ESA</i> <p style="text-align: center;"><i>Program Activities and Pollutants (Step 2)</i></p> <ul style="list-style-type: none">■ <i>Activities performed (see Table 2-4)</i>■ <i>Potential Pollutants (See Table 2-4)</i>■ <i>Pollutants of concern into a 303(d) listed water body or other ESA</i>■ <i>Potential non-stormwater discharges</i>

2.2.1 Fixed Facility Inventory Procedures

Step 1 – Determine Fixed Facilities Type and Location

The first step in the inventory process is to identify fixed facilities that are owned and operated or owned and leased by the city (county). Baseline information about the fixed facility needs to be developed including the name, address, type of facility, longitude and latitude, and watershed.

Each fixed facility should be identified with a main and sub-category type within the inventory. The main and sub-category types that typically have the greatest potential for discharging pollutants are listed in Table 2-2.

A site map should be prepared for each fixed facility that includes:

- The facility boundaries
- The outline of all stormwater drainage areas
- Portions of the drainage area impacted by run-on from surrounding areas
- Direction of flow of each drainage area
- On-site surface water bodies
- Areas of soil erosion
- Nearby water bodies (such as rivers, lakes, ponds)
- Municipal storm drain inlets where the facility’s stormwater discharges
- Stormwater collection and conveyance system, associated points of discharge, and the flow direction

Main Fixed Facility Types	Subcategory of Fixed Facilities
Municipal Waste Facilities	Active or Closed Municipal Landfills
	Publicly Owned Treatment Facilities
	Incinerators
	Solid Waste Transfer Facilities
	Land Application Sites
	Sites for Disposing and Treating Sewage Sludge
	Hazardous Waste Treatment, Disposal, and Recovery Facilities
	Uncontrolled Sanitary Landfills
Corporation Yards	Corporation Yards
	Maintenance Yards
	Storage Yards for Materials
Other Municipal Owned and/or Operated Facilities	Airfields
	Parks, Cemeteries & Golf Courses
	Public Buildings (Police, Fire, Libraries, etc.)
	Stadiums
	Stables
	Boat/Shipping Yards
	Animal Shelters/Services
	Public Parking Facilities
	Fairgrounds
	Other Facilities Identified by the Municipality

- Control measures that affect stormwater discharges
- Locations of all catch basins
- Location of authorized non-stormwater discharges to the storm drain
- Outline of all impervious areas of the facility
- Locations where materials are directly exposed to precipitation
- Locations where significant spills or leaks have occurred
- Areas of municipal activities

The inventory should also determine whether the facility is within or adjacent to or discharging directly to an Environmentally Sensitive Area (ESA). For the purposes of this Handbook, “adjacent” is defined as being located within 200 feet of the listed water body. “Discharging directly to” is defined as a discharge from a drainage system servicing the subject facility or activity that flows to the ESA without mixing with other flows (i.e., discharge from an urban area that co-mingles with downstream flows prior to an ESA is not subject to this definition).

An ESA exists if any of the following designations have been applied to the water body of concern:

- Clean Water Act 303(d) listed impaired water body. It should be noted that the 303(d) list is updated on a regular basis by the state and USEPA. Each time that happens, maps showing 303(d) listed water bodies and the inventories will need to be updated.
- Areas designated as Areas of Special Biological Significance (also known as State Water Quality Protection Area) by the SWRCB
- Water bodies designated with the RARE beneficial use by the SWRCB
- Water bodies located within areas designated as preserves or equivalent under the Natural Community Conservation Planning Program
- Areas designated as Critical Aquatic Resources
- Any other equivalent ESAs that contain water bodies which have been identified to be of local concern

An example of an inventory of municipal operations is provided in Appendix A.

Step 2 – Identify Potential Pollutant Generating Activities

In addition to the identification of the main and subcategories of fixed facility types in Step 1, the potential pollutant generating activities and potential pollutants for each fixed facility should be identified and included in the inventory.

A list of fixed facility activities that have the potential to generate pollutant discharges and the potential pollutants that are associated with those activities is presented in Table 2-3. This list is not inclusive but does provide a good starting point to identify potential pollutants. In addition to these activities, efforts should be made to compile a list of past significant spills and leaks and a list of materials and chemicals stored on-site.

Finally, determine if pollutants associated with identified activities have the potential to discharge into 303 (d) listed water bodies for which the pollutant is listed.

Fixed Facility Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Building and Grounds Maintenance and Repair	X	X	X	X	X	X	X	X	X
Parking/Storage Area Maintenance	X	X	X	X	X	X	X		X
Waste Handling and Disposal	X	X	X	X	X	X	X	X	X
Vehicle and Equipment Fueling			X	X		X	X		
Vehicle and Equipment Maintenance and Repair				X		X	X		
Vehicle and Equipment Washing and Steam Cleaning	X	X	X	X		X	X		
Outdoor Loading and Unloading of Materials	X	X	X	X		X	X	X	X
Outdoor Container Storage of Liquids		X		X		X	X	X	X
Outdoor Storage of Raw Materials	X	X	X			X	X	X	X
Outdoor Process Equipment	X		X	X		X	X		
Over water Activities			X	X	X	X	X	X	X
Landscape Maintenance	X	X	X		X			X	X

2.2.2 Field Program Inventory Procedures

Step 1 – Determine Field Program Type and Location

The first step in the inventory process is to identify all field programs conducted by a municipality. The field program and associated activities that have the potential for pollutant discharges are listed in Table 2-4. This list is not inclusive but serves as a starting point for identifying applicable field programs. Baseline information about field programs should be included in the inventory, such as the approximate area of coverage for the field program and an identifier if the performance of the field program is contracted out.

In addition, the watershed where the program occurs should be identified. Most field programs are conducted throughout a political jurisdiction and therefore may affect multiple watersheds. The inventory should reflect all those watersheds in which field programs occur. Mapping the field program infrastructure according to watershed may be useful in this step. As with the fixed facilities inventory information regarding environmentally sensitive areas including location and stressor pollutant should be compiled as part of the inventory effort. See Table 2-1 for a more complete list of information that may be collected during the inventory procedure.

Step 2 – Identify Potential Pollutant Generating Activities

The potential pollutant generating activities and potential pollutants for each field program must be identified and included in the inventory. A list of field program activities that have the potential to generate pollutant discharges and the potential pollutants that are associated with those activities is presented in Table 2-4.

Although Table 2-4 identifies the primary pollutants typically associated with stormwater runoff there are other environmental conditions that may be applicable to a field program. These include pH, temperature, and toxicity.

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Table 2-4 Field Program Activities and Associated Potential Pollutants

Field Programs	Activities	Potential Pollutants								
		Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Roads, Streets, and Highways Operation and Maintenance	Sweeping and Cleaning	X		X	X		X			X
	Street Repair, Maintenance, and Striping /Painting	X		X	X		X	X		
	Bridge and Structure Maintenance	X		X	X		X	X		
Plaza, Sidewalk, and Parking Lot Maintenance and Cleaning	Surface Cleaning	X	X			X	X			X
	Graffiti Cleaning	X	X		X			X		
	Sidewalk Repair	X		X						
	Controlling Litter	X		X		X	X			X
Fountains, Pools, Lakes, and Lagoons Maintenance	Fountain and Pool Draining		X					X		
	Lake and Lagoon Maintenance	X	X	X		X			X	X
Landscape Maintenance	Mowing/Trimming/Planting	X	X	X		X			X	X
	Fertilizer & Pesticide Management	X	X						X	
	Managing Landscape Wastes			X					X	X
	Erosion Control	X	X							
Drainage System Operation and Maintenance	Inspection and Cleaning of Stormwater Conveyance Structures	X	X	X		X		X		X
	Controlling Illicit Connections and Discharges	X	X	X	X	X	X	X	X	X
	Controlling Illegal Dumping	X	X	X	X	X	X	X	X	X
	Maintenance of Inlet and Outlet Structures	X		X	X		X			X
Waste Handling and Disposal	Solid Waste Collection		X	X	X	X	X	X		X
	Waste Reduction and Recycling			X	X					X
	Household Hazardous Waste Collection			X	X		X	X	X	
	Controlling Litter			X	X	X		X		X
	Controlling Illegal Dumping	X		X		X	X		X	X
Water and Sewer Utility Operation and Maintenance	Water line Maintenance	X				X	X			
	Sanitary Sewer Maintenance	X				X	X			X
	Spill/Leak/Overflow Control, Response, and Containment	X	X			X		X		X

2.3 Assessment

This section outlines the procedures for assessing fixed facilities and field programs for BMP selection and implementation. Data gathered during the inventory process should be used to support the assessment process described below.

2.3.1 Assessment of Fixed Facilities

The first step in the assessment is to identify BMPs already in place at a facility. These may include pavement sweeping, drain inlet cleaning, covered waste storage bins, and spill prevention and cleanup procedures. This information should be considered when determining which BMPs should be selected and implemented at a site. Worksheet 1 provides a checklist that may be helpful in determining existing BMPs at a site. Other BMPs that were installed for reasons unrelated to stormwater control, such as berming, covered materials storage, and designated wash areas, should also be identified.

Once the existing BMPs have been identified and the inventory completed per Section 2.2, an assessment of all municipal activities and potential pollutant sources should be conducted to determine which areas of the facility are likely sources of pollutants in stormwater and non-stormwater discharges, and which pollutants are likely to be present in stormwater and non-stormwater discharges. Worksheet 1 may help with this task.

Facility operators must then decide whether additional or new BMPs should be implemented to reduce stormwater pollutants to the maximum extent practicable from a site. The municipality should consider and evaluate various factors when performing this assessment, such as:

- effectiveness of current BMPs
- type of activities
- type and quantities of significant materials handled, produced, stored, or disposed of
- history of spill or leaks
- non-stormwater discharges
- size of facility (including percent impervious)
- proximity to receiving water and/or type of receiving water

The municipality should also consider whether its facility is discharging pollutants identified to be causing impairment in the local water bodies. Appendix B provides an example of a method for assessing a facility for BMP implementation.

2.3.2 Assessment of Field Programs

Similar to the effort at a fixed facility a municipality should identify BMPs that are already in place and the extent of their effectiveness. Using this information and the inventory data the municipality can identify the activities with the potential for discharging pollutants, the type of

pollutants being discharged, and the extent that the pollutants are being addressed with current procedures or BMPs. The municipality can then assess whether additional or new BMPs are necessary. In considering the need for new or additional BMPs, a municipality should consider:

- effectiveness of current BMPs
- type of field program and pollutants being discharged
- exposure of activities to stormwater
- land use category
- proximity to receiving water and/or type of receiving water

2.4 Identify and Select BMPs

Selection of BMPs should focus first on source control BMPs and second on treatment control BMPs. Typically, source control BMPs will serve to reduce pollutants from activities to the maximum extent practicable. Treatment control BMPs should be considered when source control BMPs have been shown to be ineffective or when special environmental or site conditions warrant a more comprehensive approach. The reader is referred to the New Development and Redevelopment BMP Handbook if treatment control BMPs are determined to be necessary. An example of selecting source control BMPs is provided in Appendix C.

Municipalities can identify and select BMPs from those presented in Section 3 – Source Control BMPs. The BMPs are described in activity-based and field program-based fact sheets that also provide information on the pollutants that can be addressed by the BMP. The BMPs shown in Section 3 are a comprehensive collection and not all may be applicable to the activities or field programs of a particular municipality. In order to be effective, BMPs must be appropriate to the application and properly implemented.

Municipalities must also consider the maintenance requirements of existing treatment control BMPs. In this regard, the municipality should refer to Section 4 – Treatment Control BMPs. The fact sheets in Section 4 are focused on the maintenance requirements of these treatment control BMPs. Proper maintenance is necessary for these controls to operate effectively.

WORKSHEET 1

Facility Name:
Contact Name:

Site Address:
Phone:

1. **ACTIVITIES** – In the table below check each activity present at the site and evaluate its **potential for pollutant discharge (PPD)**: 1 = high potential, 2= medium potential, 3= low potential
2. **BMP EFFECTIVENESS** – In the table below, provide an effectiveness rating using the provided scale.

ACTIVITY AND BMP CHECKLIST				
	APPLICABLE ACTIVITY			EFFECTIVENESS RATING *
	Yes	No	PPD	
A. VEHICLE AND EQUIPMENT FUELING BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
B. VEHICLE AND EQUIPMENT WASHING/STEAM CLEANING BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
C. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
D. OUTDOOR LOADING/UNLOADING OF MATERIALS BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
E. OUTDOOR CONTAINER STORAGE OF LIQUIDS BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
F. OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
G. OUTDOOR STORAGE OF RAW MATERIALS BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
H. WASTE HANDLING AND DISPOSAL BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
I. BUILDING AND GROUNDS MAINTENANCE BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
J. PARKING/STORAGE AREA MAINTENANCE BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
K. OVER WATER ACTIVITIES BMPs employed:	[]	[]	[]	① ② ③ ④ ⑤
L. OTHER (describe):	[]	[]	[]	① ② ③ ④ ⑤

- *① **No BMPs used and stormwater pollution likely** ② **Some BMPs used but not effective** ③ **Some BMPs used and moderately effective**
 ④ **Source control BMPs used and very effective/structural BMPs needed** ⑤ **All necessary BMPs used and very effective**

3. TYPE AND QUANTITY OF MATERIALS USED

Material	Typical Quantity/Frequency	Is Stored Material Likely to Generate Pollutants
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4. HISTORY OF SPILLS AND LEAKS

- a) Is there a chronic history of spills and leaks? _____

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- b) Is there no evidence of leaks and drips from equipment and machinery? _____
- c) Is there a spill prevention and response team? _____
- d) Are appropriate spill containment and cleanup materials kept on-site and in convenient locations? _____
- e) Are cleanup procedures for spills followed regularly and correctly? _____
- f) Are used absorbent materials removed and disposed of in a timely manner? _____
- g) Are personnel regularly trained in the use of spill control materials? _____

5. NON-STORMWATER DISCHARGES

- a) Outfall directly observed during assessment _____
- b) Are BMPs implemented to prevent, treat, or control non-stormwater discharges? _____
- c) Is there a potential for non-stormwater discharges (i.e. non-stormwater sources observed without BMPs implemented) _____

6. SIZE OF FACILITY (incorporating the size of a facility serves as a surrogate measure for flow)

- a) Total area _____
- b) The impervious area (including parking lot) is _____

7. PROXIMITY TO RECEIVING WATER

Does the facility discharge directly or adjacent to a 303(d) water body or other environmentally sensitive area? _____