



MEMORANDUM

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TO: BMP O & M Verification Work Group

FROM: Paul Randall and John Fusco, Program Staff

DATE: September 29, 2003 [FINAL]

SUBJECT: Stormwater Treatment BMP Inspection Program Elements

The purpose of this memorandum is to identify the important elements of a municipal inspection program for stormwater treatment Best Management Practices (BMPs). This information will assist municipal staff in developing or enhancing existing inspection program elements to ensure long-term operation and maintenance (O&M) of stormwater treatment BMPs.

Background

During the April 23, 2003 BMP O & M Verification Work Group meeting, Program staff was requested to develop a memorandum identifying the important elements of a municipal inspection program for verifying BMP O & M. Since Co-permittees are aware of how to structure an inspection program, Work Group members agreed that it was not necessary for Program staff to develop a guidance memorandum that discusses how to develop an inspection program. The Work Group also requested that Program Staff provide Co-permittees with information on costs associated with inspections. This information is discussed in a separate memorandum.

This memorandum provides a general description of inspection program elements which may be used to enhance municipal inspection program effectiveness and supplements information provided within the memorandum entitled *Guidance on Prioritization and Frequency of Stormwater Treatment Best Management Practice Inspections*.

Elements of a Stormwater Treatment BMP Inspection Program

The primary elements of a municipal inspection program include:

- Maintaining a Database of Installed Treatment BMPs
- Establishing Inspection Priorities and Frequencies
- Staff Training
- Conducting BMP Inspections (including inspection follow-up and enforcement actions)
- Documentation and Effectiveness Evaluation

A brief description of each element, along with references to existing documentation, is provided.

Maintaining a Database of Installed Treatment BMPs

Permit Provision C.3.e.i requires Co-permittees to compile a list of properties (public and private) and responsible operators for all treatment BMPs. Initially, Co-permittees will compile this list during the development project approval process. To ensure that individuals responsible for inspection obtain accurate information regarding installed treatment BMPs (e.g., location, responsible owner/operator,

implemented measure), Program staff suggests that Co-permittees establish a mechanism to ensure that information is easily shared between involved departmental units with an organization (community development, construction inspection, post-construction inspection). The suggested method of information sharing is through the use of a relational database or other tracking mechanism. Reports detailing all relevant project information could be created and distributed to agency staff responsible for inspecting and/or maintaining treatment BMPs. The database could also be used to document and track treatment BMP inspection frequencies. BMP information will be initially gathered with the Reporting Form for Planning Procedures Performance Standard and Provision C.3.n. Reporting Requirements (Attachment 6 of the Planning Procedures Performance Standard).

Inspection Priorities and Frequencies

Permit Provision C.3.e.i of the Program's Municipal Storm Water NPDES permit requires Co-permittees to "inspect a subset of prioritized treatment measures for appropriate operation and maintenance, on an annual basis, with appropriate follow-up and correction." To assist Co-permittees in determining the inspection priority and frequency of stormwater treatment BMPs implemented within their jurisdictions, Program staff developed a detailed memorandum entitled *Guidance on Prioritization and Frequency of Stormwater Treatment Best Management Practice Inspections*. Using existing information resources, Program staff identified eight criteria to consider when prioritizing the municipal inspection of public and privately owned stormwater treatment BMPs. Each Co-permittee should use the most appropriate criteria for prioritizing and inspecting BMPs based on local conditions and characteristics. Inspection frequencies may also be adjusted based on evaluating the effectiveness of existing maintenance activities over time; costs associated with follow-up activities (e.g., required responses to address improperly maintained BMPs); and the availability of resources to conduct inspections. Additional information regarding the prioritization and frequency of inspections is discussed in the referenced memorandum.

Staff Training

To ensure proper facility inspection and maintenance of stormwater treatment BMPs, Program staff suggests that individual Co-permittees train their respective staffs in proper maintenance and operational procedures. At a minimum, inspectors should be knowledgeable about the key parameters that trigger maintenance activities for each stormwater treatment BMP and how to measure and evaluate each parameter. Additional information (prepared by the Watershed Management Institute, Inc.) regarding the content of training programs is provided as [Attachment 1](#). All attachments referenced within this memorandum are provided as electronic links.

Conducting BMP Inspections

The Center for Watershed Protection (www.stormwatercenter.net) has identified four major aspects of a stormwater BMP inspection. They include:

- Notification of Inspection
- Pre-inspection Preparation
- Conduct Inspections Using Standardized Checklists
- Inspection Follow-up and Maintenance Notification

Additional information (prepared by the Center for Watershed Protection) regarding inspection steps is provided in [Attachment 2](#).

Notification of Inspection

Municipal staff should establish procedures for communicating maintenance expectations to stormwater treatment BMP owners and operators. One method is to provide a Notification of Inspection Letter to inform the BMP owner or operator that an inspection is scheduled. The letter should provide detailed information about what the BMP owner or operator can expect; encourage the completion of routine maintenance actions prior to the inspection; and other pertinent information (facility owner, facility address, facility ID number) relating to the inspection. Inspection notification should better prepare the

BMP owner or operator for the inspection and hopefully eliminate unnecessary concerns and confusion. An example of a facility inspection notification letter developed by Howard County, Maryland is provided as [Attachment 3](#).

Co-permittees should also provide educational materials to ensure that stormwater treatment BMP owners and operators are aware of their obligations and responsibilities regarding inspection and maintenance. Educational materials should include information on the various facility components; importance of regular inspection and maintenance; and the key parameters that trigger maintenance activities. BMP Fact Sheets (created by the California Stormwater Quality Association and Program staff) are a good educational resource regarding inspection and maintenance considerations.

Pre-inspection Preparation

Prior to inspecting stormwater treatment BMPs, municipal inspectors should thoroughly prepare by reviewing educational materials and all background information on each BMP to be inspected. Educational or public outreach materials (e.g., maintenance standards, inspection and maintenance checklists, BMP fact sheets, program information) may be used to help address questions or comments raised by BMP owners or operators during the inspection. Background information to review may include the following: site plans/as-built drawings; previous inspection results; necessary procedures (e.g., underground confined space entry); and inspection and maintenance protocols. In addition, essential inspection equipment should be gathered before conducting an inspection. Information (prepared by the Watershed Management Institute, Inc.) regarding essential inspection equipment and typical O&M tools is provided as [Attachment 4](#). A list of possible educational materials, site-specific information to review and inspection equipment to gather or review prior to an inspection is provided in [Attachment 2](#).

Conduct Inspections Using Standardized Checklists

Co-permittees should develop or use existing standardized inspection checklists to document each stormwater treatment BMP inspection. A checklist should be used for all relevant BMPs in which the Co-permittee will inspect within its jurisdiction. At a minimum, Program staff suggests that inspection checklists consist of the following characteristics:

- Contain specific parameters to reduce subjectivity (i.e., clear maintenance triggers);
- Link problems with specific actions;
- Track maintenance activities for BMPs over time; and
- Integrate well into a relational database (i.e., limited use of text fields).

The City of Bellevue, Washington has created several checklists for public and private inspection and maintenance. They were attached to the memorandum entitled *Guidance on Prioritization and Frequency of Stormwater Treatment Best Management Practice Inspections* but are linked to the electronic version of this document. Each checklist may need to be modified to account for differences in regional characteristics for the Santa Clara Valley; and any variation in the local conditions found in each site.

Another important issue to consider is the personal safety of municipal staff during inspection and maintenance activities. A list of safety issues to consider when conducting inspection and maintenance activities (prepared by the Watershed Management Institute, Inc.) is provided in [Attachment 5](#).

Inspection Follow-up and Maintenance Notification

Once the stormwater treatment BMP has been inspected, Co-permittees should provide written correspondence (to the BMP owner or operator) describing the inspection results and compliance status. In addition, the letter should include:

- List of necessary repairs or maintenance, if applicable
- Outline of the repair process (including timeline for expected results), if applicable
- BMP inspection report

- BMP inspection checklist
- Educational materials (e.g., BMP Fact Sheets)
- Maintenance standards
- Other relevant information

Examples of maintenance notification letters (developed by Howard and Montgomery Counties, Maryland, respectively) are provided as [Attachment 6](#) and [Attachment 7](#).

When the BMP owner or operator fails or refuses to comply with the terms of a permit; provisions of an ordinance or policy; and/or with initial requests to conduct maintenance or repairs, the agency will need to send a Notice of Violation (or some other enforcement tool in accordance with individual Co-permittee enforcement procedures). A Notice of Violation usually includes:

- Name and address of the BMP owner or operator;
- Address of the site upon which the violation is occurring;
- References to previous correspondence and inspections;
- A statement specifying the nature of the violation
- List of repairs or maintenance needed to bring the facility into compliance;
- Compliance schedule; and
- Consequences of non-compliance.

An example of a Notice of Violation (developed by Montgomery County, Maryland) is provided as [Attachment 8](#).

Documentation and Effectiveness Evaluation

Permit Provision C.3.e.iii of the Program's Municipal Storm Water NPDES permit requires Co-permittees to conduct "...an evaluation of the Discharger's O&M verification program's effectiveness; summary of any planned improvements in O&M verification; and a list or summary of treatment BMPs that have been inspected that year with inspection results."

During the September 25, 2003 BMP O & M Verification Work Group meeting, Program staff presented two approaches relating to data management relevant to the C.3.e reporting requirements. They included the following: 1) Co-permittees incorporate information into their data management schemes using standardized fields developed by the Work Group; and 2) Program staff develops a relational database (for Co-permittee use) which uses standardized fields. After some discussion, Work Group members decided that it was not necessary to develop a relational database for C.3.e reporting. Certain Work Group members stated that their agencies had existing databases that could be modified to track BMP O & M verification information. Other members stated that they would not use a Microsoft Access database due to using existing database software. In addition, the number of Group 1 projects anticipated for many of the smaller cities is small. As a result, there would be very few projects to track, making a database unnecessary. However, projects may increase once Group 2 project requirements are implemented. The Work Group suggested revisiting the need for a database once Group 1 and Group 2 requirements are implemented.

References

Center for Watershed Protection: Stormwater Manager's Resource Center. Maintenance Inspection Checklists, Notifications and Reminders. [Online] Available: http://www.stormwatercenter.net/Manual_Builder/Maintenance_Manual/8-%20Maintenance%20Inspection%20Checklists%20Notifications%20and%20Reminders/Maintenance%20Inspection%20Checklist%20Introduction.htm, March 12, 2003

Center for Watershed Protection: Stormwater Manager's Resource Center. Howard County, Maryland Storm Water Management Facility Inspection Notification Letter. [Online] Available: http://www.stormwatercenter.net/Manual_Builder/Maintenance_Manual/8-

http://www.stormwatercenter.net/Manual_Builder/Maintenance_Manual/8-%20Maintenance%20Inspection%20Checklists%20Notifications%20and%20Reminders/Facility%20Inspection%20Notification%20-%20Howard%20Cty%20MD.pdf, March 12, 2003.

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Center for Watershed Protection: Stormwater Manager's Resource Center. Montgomery County, Maryland Notice of Violation. [Online] Available:

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Watershed Management Institute, Inc. *Operation, Maintenance, and Management of Stormwater Management Systems*, August 1997.