CHAPTER 3
PHASE I PERMITTING

Consistent with the Combined Sewer Overflow (CSO) Control Policy, the National Pollutant Discharge Elimination System (NPDES) permitting authority and the individual permit writer should approach the CSO permitting process as a two-phased process. This chapter provides guidance on developing and issuing initial or Phase I NPDES permits for CSOs. In particular, it discusses how to develop permit conditions for implementation of the nine minimum controls (NMC) and development of the long-term control plan (LTCP) to meet the technology- and water quality-based requirements of the Clean Water Act (CWA).

3.1 PHASE I PERMIT PROCESS

The Phase I permit should require the permittee to immediately implement the NMC, document implementation of the NMC, and develop the LTCP. The Phase I permit should also require the permittee to gather data to establish the baseline conditions against which CSO controls will be measured.

3.2 INFORMATION NEEDS

In general, the permit writer can draft and issue a Phase I permit with a minimal amount of CSO information, because he or she can require the implementation and documentation of the NMC and development of the LTCP without site-specific data in a generic manner. Much of the data collection should occur during implementation of the NMC and development of the LTCP, and the Phase I permit will contain requirements to obtain those data. Although the CSO information base might not be extensive at the outset of the Phase I permitting process, the information base should grow and evolve during the term of the Phase I permit.

To draft and issue a Phase I permit, the permit writer should have a clear understanding of the jurisdictional boundaries and responsibilities for the combined sewer system (CSS). This information is necessary to determine which NPDES permittees should be subject to CSO requirements. Generally, where the CSS and publicly owned treatment works (POTW) are

operated by a single municipality, the permit will be issued to that municipality. Frequently, however, the relationship is more complicated; several municipalities might own part of the CSS but discharge to a single POTW treatment plant. In this case, CSO permits may be issued to several different municipalities.

In addition, the permit writer should have a thorough understanding of the permittee's past and current progress toward controlling CSOs. First, the permit writer should know which, if any, of the NMC have already been implemented. If any of the NMC have been implemented, the permit writer may determine that site-specific rather than generic permit language is more appropriate for continued implementation of those minimum controls. (See Section 4.4.2 for a discussion of site-specific permit language for the NMC.) The permit writer should also know whether the permittee has substantially developed a CSO control plan, is implementing a CSO control program, or has substantially completed construction of CSO control facilities. If the permittee has completed efforts to control CSOs, the permit writer should consider this progress when drafting the Phase I permit. (Section 3.5.3 provides more information on addressing ongoing CSO control efforts).

The permit writer should also know the approximate population of the community served by the CSS. If the CSS serves a population of less than 75,000, the permit writer may give special consideration to the permittee in developing the LTCP. (Section 3.5.3 provides more information on small system considerations.)

In some instances, pertinent CSO information might be difficult to obtain. In any event, the permit writer should, using readily available information, develop permit conditions requiring the permittee to implement the NMC, document NMC implementation, and develop the LTCP as soon as practical.

Information may be obtained from the NPDES permit application or through informal requests by letter, telephone, or in-person visits. In a limited number of cases, the permit writer may use a more formal mechanism, such as a CWA Section 308 information request or State

equivalent. The Section 308 information request is likely to be an effective approach to obtain information because failure to comply with a Section 308 information request may result in an enforcement action. The permit writer should follow the EPA Regional or State-specific policies regarding such information requests.

3.3 IDENTIFICATION OF CSO OUTFALLS IN THE PERMIT

The permittee might not have identified the locations of all CSO outfalls prior to the issuance of the Phase I permit, although this is a desirable goal. To the extent that the CSO outfalls are known, the permit writer should list them in the permit. If the exact location and number of all outfalls are not known, however, the permit writer should not wait to issue the Phase I permit until this information is available but should include generic permit language to encompass all CSOs. All CSO outfalls should be identified as the municipality characterizes its CSS during LTCP development. Exhibit 3-1 provides example permit language for a CSS for which all CSO outfalls are not known prior to issuance of the Phase I permit. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee.

Exhibit 3-1. Example Permit Language for Identifying CSO Outfalls in the Phase I Permit

The permittee is authorized to discharge from the CSO outfalls listed below and additional CSO outfalls within the boundaries of the permittee's jurisdiction identified after the effective date of the permit. The permittee shall ensure that all CSOs from the CSS comply with the requirements of **[insert appropriate permit section(s) containing CSO requirements]** and other pertinent portions of this permit.

Outfall Number	Overflow Outfall Location	Receiving Water Body
[insert number]	**[insert latitude/longitude (street address optional)]**	**[insert name of receiving water body]**

3.4 NINE MINIMUM CONTROLS

The Phase I permit should require all permittees to immediately implement technology-based requirements (best available technology economically achievable (BAT)/best conventional pollutant control technology (BCT)) which, in most cases, are expected to be the NMC, as determined on a best professional judgment (BPJ) basis by the NPDES permitting authority. The NMC are controls that are designed to reduce the magnitude, frequency, and duration of CSOs

and their effects on receiving water quality. Typically, they do not require significant engineering studies or major construction and can be implemented in a relatively short time period. Section 301(b) of the CWA requires immediate compliance with technology-based controls (i.e., BAT or BCT). Thus, if immediate compliance with the NMC cannot be achieved, an appropriate enforceable mechanism should accompany the permit. The enforceable mechanism should contain a compliance schedule for implementing the NMC as soon as practicable, but no later than January 1, 1997. (See Section 3.4.1 for more detail.) Section 2.4 describes additional mechanisms for implementation of NMC in cases where the permit is not expected to be reissued in the normal five-year cycle prior to January 1, 1997.

The NMC are intended to provide technology-based controls, applied on a site-specific basis, that will immediately reduce CSO impacts on water quality and that can be implemented early in the control process without the type of in-depth studies necessary for the LTCP. Exhibit 3-2 lists examples of NMC measures. Section 3.6 further discusses the use of the NMC to satisfy the BAT/BCT requirement on a BPJ basis. The U.S. Environmental Protection Agency (EPA)'s *Combined Sewer Overflows—Guidance for Nine Minimum Controls* provides a detailed description of each minimum control, example measures for each control, and their associated advantages and limitations (EPA, 1995b). Although the permittee will be responsible for implementing technology-based control measures that satisfy each of the NMC, EPA does not expect that a separate set of control measures will necessarily be required for each control. Rather, EPA encourages a holistic approach to addressing the NMC. For example, the same control measure(s) could satisfy both "Control of Solid and Floatable Materials" and "Pollution Prevention."

Exhibit 3-2. Summary of the Nine Minimum Controls

Minimum Control	Examples of Control Measures	
Proper Operation and Maintenance	• Maintain/repair regulators • Maintain/repair tidegates • Remove sediment/debris • Repair pump stations • Develop inspection program • Inspect collection system	
Maximum Use of Collection System for Storage	• Maintain/repair tidegates • Adjust regulators • Remove small system bottlenecks • Prevent surface runoff • Remove flow obstructions • Upgrade/adjust pumping operations	
Review and Modify Pretreatment Requirements	Volume Control • Diversion storage • Flow restrictions • Reduced runoff • Curbs/dikes	Pollutant Control • Process modifications • Storm water treatment • Improved housekeeping • BMP Plan
Maximum Flow to the POTW for Treatment	• Analyze flows • Analyze unit processes • Analyze headloss • Evaluate design capacity • Modify internal piping • Use abandoned facilities • Analyze sewer system	
Eliminate Dry Weather Overflows	• Perform routine inspections • Remove illicit connections • Adjust/repair regulators • Repair tidegates • Clean/repair CSS • Eliminate bottlenecks	

Minimum Control	Examples of Control Measures
Control of Solid and Floatable Materials in CSOs	• Screening – Baffles, trash racks, screens (static and mechanical), netting, catch basin modifications • Skimming – booms, skimmer boats, flow balancing • Source controls - street cleaning, anti-litter, public education, solid waste collection, recycling
Pollution Prevention	• Source controls (see above) • Water conservation
Public Notification	• Posting (at outfalls, use areas, public places) • TV/newspaper notification • Direct mail notification
Monitoring	• Identify all CSO outfalls • Record total number of CSO events and frequency and duration of CSOs for a representative number of events • Summarize locations and designated uses of receiving waters • Summarize water quality data for receiving waters • Summarize CSO impacts/incidents

Implementation of the NMC should enable the permittee to achieve an intermediate level of CSO control while the LTCP is being developed. Implementation and documentation of the NMC should involve the following steps:

- Evaluate alternative control measures for implementing each of the NMC. The permittee should be required to evaluate alternatives and select appropriate control measures to meet the NMC.

- Implement the most appropriate control measures. The permittee should be required to implement those control measures that are most appropriate for the site. The control measures should be refined in Phase II, as appropriate, to reflect the information obtained during the Phase I permit term. These control measures should eventually become part of the long-term CSO control program.

- Document implementation of the selected control measures. This documentation should detail the baseline conditions prior to NMC implementation, the permittee's evaluation of the efficacy of CSO controls after implementation of the NMC, the baseline conditions upon which the LTCP should be developed, and the degree to which the NMC are sufficient to provide attainment of water quality standards (WQS).

- Report on implementation. The permittee should be required to submit appropriate documentation to illustrate implementation of the NMC (discussed in Section 3.4.2).

3.4.1 Implementation Considerations

Because the compliance date contained in the CWA for technology-based requirements has lapsed, the permit writer should require the NMC to be implemented immediately. When the permittee cannot comply with such permit conditions, the permit writer should coordinate with enforcement authority staff to prepare an enforcement order, including a compliance schedule with fixed dates. In accordance with the CSO Control Policy, the NMC should be implemented with appropriate documentation as soon as practicable, but no later than January 1, 1997.

Exhibit 3-3 provides example permit language requiring implementation of the NMC. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. The permit writer must also prepare a fact sheet or statement of basis associated with the implementation of the NMC. The permit writer must show that the permittee's NMC satisfy

Exhibit 3-3. Example Permit Language to Require Immediate Implementation of the Nine Minimum Controls

I. Effluent Limits

A. Technology-based requirements for CSOs. The permittee shall comply with the following technology-based requirements:

1. The permittee shall implement proper operation and maintenance programs for the sewer system and all CSO outfalls to reduce the magnitude, frequency, and duration of CSOs. The program shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.

2. The permittee shall implement procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.

3. The permittee shall review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from the discharges from nondomestic users.

   [Alternative language for a permittee without an approved pretreatment program:] The permittee shall evaluate the CSO impacts from nondomestic users and take appropriate steps to minimize such impacts.

4. The permittee shall operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.

5. Dry weather overflows from CSO outfalls are prohibited. Each dry weather overflow must be reported to the permitting authority as soon as the permittee becomes aware of the overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.

6. The permittee shall implement measures to control solid and floatable materials in CSOs.

7. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

8. The permittee shall implement a public notification process to inform citizens of when and where CSOs occur. The process must include (a) a mechanism to alert persons of the occurrence of CSOs and (b) a system to determine the nature and duration of conditions that are potentially harmful to users of receiving waters due to CSOs.

9. The permittee shall monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls. This shall include collection of data that will be used to document the existing baseline conditions, evaluate the efficacy of the technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. These data shall include:

   a. Characteristics of combined sewer system including the population served by the combined portion of the system and locations of all CSO outfalls in the CSS
   b. Total number of CSO events and the frequency and duration of CSOs for a representative number of events
   c. Locations and designated uses of receiving water bodies
   d. Water quality data for receiving water bodies
   e. Water quality impacts directly related to CSOs (e.g., beach closing, floatables wash-up episodes, fish kills).

the BAT/BCT requirements based on BPJ of the permit writer, considering the factors presented in 40 CFR 125.3(d). These factors include the age of equipment and facilities involved, engineering aspects of the application of various types of control measures, and the reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits achieved. The *Training Manual for NPDES Permit Writers* contains additional details on the use of BPJ in developing permit conditions (EPA, 1993g).

When the permittee is already implementing some or all of the NMC, the permit writer should customize the permit language to address site-specific conditions. For example, if the permittee is already implementing an operation and maintenance (O&M) program, the permit writer might craft language that specifically addresses CSS inspection frequency. If the permittee is already controlling solid and floatable materials, the permit writer may augment the general language to address the specific controls being implemented. Where the permittee has already selected long-term CSO controls, the permit writer should coordinate the development of the permit language requiring NMC implementation with implementation of such controls. This is because some of the control measures might not be appropriate when the selected long-term CSO controls have been implemented (e.g., if a CSO outfall is being eliminated). Section 4.4.2 addresses potential site-specific permit conditions in greater detail. Most importantly, the permit writer should ensure that the permit language reflects the permittee's site-specific conditions, is consistent with the CSO Control Policy, and is enforceable.

It is important to note some additional implementation considerations pertaining to specific minimum controls:

Pretreatment: In the case where the permittee does not have an approved pretreatment program under 40 CFR Part 403, the permit writer should require the permittee to identify its nondomestic users, evaluate the impacts of such users on CSOs, and take steps, as appropriate, to minimize these impacts within the CSS "up-pipe" of the CSOs. Alternative language for this situation is presented in Exhibit 3-3.

Maximizing flow: In developing a permit condition for maximizing flow to the POTW for treatment, the permit writer should consider the secondary treatment regulations in 40 CFR Part 133, which specify numeric effluent limits for biochemical oxygen demand and total suspended solids, as well as a minimum percent removal (85 percent) for secondary treatment. Secondary treatment requirements are enforceable conditions in POTW permits.

Section 133.103(a) and (e) provides relief for POTWs with CSSs that process elevated flows (and more dilute influents) by allowing for the possibility of a waiver of the percent removal requirement. Waivers from effluent concentration limits are not available, however. The decision to apply a waiver and the recalculation of the percent removal are made on a case-by-case basis.

3.4.2 Documentation and Reporting

The Phase I permit should require the permittee to submit documentation demonstrating the implementation of each of the NMC. The CSO Control Policy recommends that the NPDES permitting authority require this documentation to be submitted as soon as practicable but no later than two years after permit issuance. The purpose of the documentation is to 1) verify that the permittee has evaluated, selected, and implemented CSO controls for each of the NMC, 2) document the existing baseline conditions, evaluate the efficacy of the CSO controls after implementation of the NMC, and determine the baseline conditions upon which the LTCP should be developed, and 3) evaluate the degree to which the NMC are sufficient to provide for the attainment of WQS.

The permit should require the permittee to document and report the evaluation and selection of the most appropriate control(s) for each minimum control. Exhibit 3-4 presents example permit language requiring such documentation. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. Exhibit 3-5 and EPA's guidance for nine minimum controls (EPA, 1995b) contain examples of NMC documentation. The permit writer should review the example types of documentation in Exhibit 3-5 and the NMC guidance document and choose the appropriate items to be required in the permit. NMC

Exhibit 3-4. Example Permit Language for Requiring Documentation and Reporting of the Nine Minimum Controls

II. Reporting Requirements

A. Reporting implementation of nine minimum controls. The permittee shall submit documentation that demonstrates implementation of each of the nine minimum controls that includes the elements below. The permittee shall submit this documentation to the permitting authority on or before **[insert due date]**.

[insert appropriate list of documentation items]

documentation may come in a variety of forms. For example, the permittee may submit reports and studies prepared for other purposes, such as operating or facility plans, revised sewer use ordinances, sewer system inspection reports, technical studies, and pollution prevention program plans; public notification plans; and contracts and schedules for minor construction programs for improving the existing system's operation.

The documentation required in the permit should be the minimum amount necessary to demonstrate that appropriate NMC measures are being implemented. In addition, the NPDES permitting authority may choose to require the municipality to keep some records of NMC implementation on site rather than requiring all documentation to be submitted. In these cases, NPDES inspectors can review documentation that is on file during inspections.

Although not reflected in the example permit language in Exhibit 3-4, the permit writer may require periodic reports on the implementation of the NMC throughout the term of the permit. For example, the permit writer may require updates on any significant changes in NMC implementation. In addition, the permit writer may require the submission of monitoring data at a specified frequency throughout the term of the Phase I permit. In any case, the permit language should reflect the permittee's site-specific conditions.

3.5 LONG-TERM CONTROL PLAN

The second major element of the Phase I permit is the requirement to develop an LTCP that will ultimately result in the permittee's compliance with CWA requirements. For this reason, the LTCP should contain CSO controls that are adequate to provide for the attainment

Exhibit 3-5. Example Types of NMC Documentation

Proper operation and regular maintenance programs

An inventory of CSS components requiring routine operation and maintenance
An evaluation of operation and maintenance procedures to include regular inspections; sewer, catch basin, and regulator cleaning; and equipment and sewer collection system repair or replacement where necessary
Copy of, or excerpts from, an operation and maintenance manual and/or procedures for the CSS and CSO structures
Resources allocated (manpower, equipment, training) for maintenance of the CSS and CSO structures
A summary of inspections conducted and maintenance performed

Maximization of use of the sewer collection system for storage

An analysis/study of alternatives to maximize collection system storage
A description of procedures in place for maximizing collection system storage
An implementation schedule of minor construction associated with maximizing collection system storage
Description of actions taken to maximize storage
Identification of existing off-line storage potential
Identification of any additional potential actions to increase storage in the existing collection system, but that require further analysis; documentation that they will be/were evaluated in hydraulic studies conducted as part of the LTCP

Review and modification of controls on nondomestic sources

Results of an inventory of nondomestic discharges and assessment of the impact of such discharges on CSOs
Analysis of feasibility of modifications to nondomestic source controls (including local pretreatment program, if appropriate) to reduce the impact of such discharges on CSOs
Documentation of selected modifications

Maximization of flow to the POTW treatment plant for treatment

Results of any study/analysis of existing conditions and a comparison with the design capacity of the overall facility
Results or status of any engineering studies to increase treatment of wet weather flows
Documentation of actions taken to maximize flow and the magnitude of increase obtained or projected

Elimination of CSOs during dry weather flow conditions

A summary of dry weather overflows that occurred, including location, duration, and frequency
A description of procedures for notifying permitting authority of dry weather overflows
A summary of actions taken to identify dry weather overflows and progress toward eliminating dry weather overflows
A plan for complete elimination of all dry weather overflows

Control of solid and floatable materials in CSOs

An engineering evaluation of procedures or technologies considered for controlling solid and floatable materials
A description of CSO controls in place for solid and floatable materials
A schedule for minor construction
Documentation of any additional controls to be installed or implemented

Exhibit 3-5. Example Types of NMC Documentation (Continued)

Pollution prevention programs to reduce contaminants in CSOs

An evaluation of pollution prevention opportunities to include procedures to control solid and floatable materials
A description of selected pollution prevention opportunities to include resources allocated for implementation
Documentation of pollution prevention program or actions taken

Public notification

An evaluation of public notification options, including description of existing and/or proposed public notification procedures
A description of selected public notification methods
A log of CSO occurrences and associated public notification

Monitoring to characterize CSO impacts and efficacy of CSO controls

An identification of CSO outfalls in the CSS
A summary of CSO occurrences (the number of CSO events and the frequency and duration of CSOs during a representative number of events); monitoring summary for frequency and duration for overflow events may portray a representative number of CSO outfalls
A summary of existing water quality data for receiving water bodies
A summary of receiving water impacts directly related to CSOs (e.g., beach closing, floatables wash-up episodes, fish kills)
An assessment of the effectiveness of any CSO control measures already implemented (e.g., reduction of floatables)
Development of a monitoring plan for the LTCP, as appropriate

of WQS—that is, they will ensure that designated uses are not impaired and the State's water quality criteria are not exceeded. The CSO Control Policy recommends that the permittee develop and submit the LTCP as soon as practicable but generally within two years after the requirement to develop the LTCP is incorporated into a permit, Section 308 information request, or enforcement action. The CSO Control Policy also recognizes that it may be appropriate for the permit writer to establish a longer schedule for completion of the LTCP based on site-specific factors.

The LTCP development process is a comprehensive planning effort designed to evaluate a range of CSO control alternatives and result in the selection of CSO controls that will provide for the attainment of WQS. For this reason, the LTCP development process will be an incremental and, frequently, a sequential process. For example, a permittee should assess the impacts of CSOs on water quality prior to identifying a range of feasible CSO control

alternatives. In establishing the requirements to develop an LTCP, the permit writer should consider the site-specific conditions of the permittee. In a limited number of cases, implementation of the NMC may be sufficient to provide for the attainment of WQS and the permittee's efforts to develop an LTCP should appropriately reflect this situation. In other cases, the permittee may have already begun the CSO planning process and the requirement to develop an LTCP should be tailored to reflect ongoing efforts.

This section provides guidance for the permit writer on how to require development of the LTCP in accordance with the CSO Control Policy. Section 3.5.1 describes each element of the LTCP, Section 3.5.2 presents the schedule for development of the LTCP, and Section 3.5.3 discusses considerations for small systems and ongoing CSO control efforts. EPA's *Combined Sewer Overflows—Guidance for Long-Term Control Plan* contains technical guidance on the development of LTCPs (EPA, 1995a).

3.5.1 Components of the Long-Term Control Plan

The CSO Control Policy outlines the following minimum LTCP components:

- Characterization, monitoring, and modeling of the CSS and receiving waters (including identification of sensitive areas)
- Public participation
- Consideration of sensitive areas
- Evaluation and selection of alternatives
- Cost/performance considerations
- Operational plan
- Maximization of treatment at the POTW treatment plant
- Implementation schedule
- Post-construction compliance monitoring program.

In general, the permit should guide the development of the LTCP consistent with the CSO Control Policy, establishing distinct incremental actions, providing the permittee with flexibility in conducting the planning process, and ensuring enforceability of subsequent Phase II permit conditions.

Exhibit 3-6 provides example permit language requiring the development of an LTCP. This exhibit was intended to provide practical, realistic example language which should not necessarily be considered as boilerplate language. Thus, the permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. The permit conditions in this exhibit include all the components of an LTCP outlined in the CSO Control Policy. The permit writer should list specific LTCP components in the permit rather than simply require the permittee to develop an LTCP consistent with the CSO Control Policy. A permit condition such as, "The permittee shall complete and submit to the permitting authority an LTCP by **[date specified]**..." may result in the submittal of an incomplete or poorly developed plan. Listing the individual components of the plan requires the permittee to consider all of the necessary LTCP components.

The public participation component of the LTCP is discussed first in this section because it is important for the permittee to identify potential stakeholders and formulate a process that will facilitate their active involvement in LTCP development. This should be done as early as possible in the LTCP development process.

3.5.1.1 Public Participation

Under the CSO Control Policy, the permittee should employ a public participation process that actively involves the affected public in the decision-making to select the long-term CSO control(s). According to the CSO Control Policy, the affected public includes rate payers, industrial users of the sewer system, persons who live adjacent to or use water bodies affected by CSOs, and any other interested persons. Public participation is critical to the ultimate success of the CSO controls selected by the permittee, given the potential financial impact (e.g., increased fees) to the affected public. Early and constant public participation during the

Exhibit 3-6. Example Permit Language for Requiring the Development of a Long-Term Control Plan

III. Long-Term Control Plan

The permittee shall develop a long-term control plan that will include the elements contained in Sections III.A through III.D below and shall submit the plan elements in accordance with the schedule contained in Section III.E:

A. Public Participation

The permittee shall prepare and implement a public participation plan that outlines how the permittee will ensure participation of the public throughout the long-term control plan development process.

B. CSS Characterization

The permittee shall develop and implement a plan that will result in a comprehensive characterization of the CSS developed through records review, monitoring, modeling, and other means as appropriate to establish the existing baseline conditions, evaluate the efficacy of the CSO technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. The characterization shall adequately address the response of the CSS to various precipitation events; identify the number, location, frequency, and characteristics of CSOs; and identify water quality impacts that result from CSOs.

To complete the characterization, the permittee shall employ the following methods:

1. Rainfall Records Review. The permittee shall examine the complete rainfall records for the geographic areas of the CSS and evaluate the flow variations in the receiving water body to correlate between the CSOs and receiving water conditions.

2. CSS Records Review. The permittee shall review and evaluate all available CSS records and undertake field inspections and other necessary activities to identify the number, location, and frequency of CSOs and their location relative to sensitive areas (as identified in III.B.4) and to pollution sources, such as significant industrial users, in the collection system.

3. CSO and Water Quality Monitoring. The permittee shall develop and submit a monitoring program that measures the frequency, duration, flow rate, volume, and pollutant concentration of CSOs and assesses the impact of the CSOs on receiving waters. Monitoring shall be performed at a representative number of CSOs for a representative number of events. The monitoring program shall include CSOs and ambient receiving water body monitoring and, where appropriate, other monitoring protocols, such as biological assessments, toxicity testing, and sediment sampling.

4. Identification of Sensitive Areas. The permittee shall identify sensitive areas to which its CSOs occur. These areas shall include Outstanding National Resource Waters, National Marine Sanctuaries, waters with threatened or endangered species and their designated critical habitat, waters with primary contact recreation, public drinking water intakes or their designated protection areas, shellfish beds, and any other areas identified by the permittee or permitting authority, in coordination with appropriate State or Federal agencies.

5. CSS and Receiving Water Modeling. The permittee may employ models, which include appropriate calibration and verification with field measurements, to aid in the characterization. If models are used, they shall be identified by the permittee along with an explanation of why the model was selected and used in the characterization.

Exhibit 3-6. Example Permit Language for Requiring the Development of a Long-Term Control Plan (continued)

C. CSO Control Alternatives

1. Development of CSO Control Alternatives. The permittee shall develop a range of CSO control alternatives that would be necessary to achieve **[insert appropriate range of levels of control (e.g., zero overflow events per year, an average of 1 to 3, 4 to 7, and 8 to 12 overflow events per year)]**. The permittee shall consider expansion of the POTW treatment plant secondary and primary capacity as an alternative.

   Alternatives presented must give the highest priority to controlling CSOs to the sensitive areas identified in III.B.4 above. For such areas, the alternatives included in the plan must (1) prohibit new or significantly increased CSOs, (2) eliminate or relocate CSOs from such areas wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment, (3) where elimination or relocation is not physically possible or economically achievable or would provide less environmental protection than additional treatment, provide the level of treatment for remaining CSOs deemed necessary to meet water quality standards for full protection of existing and designated uses.

2. Evaluation of CSO Control Alternatives. The permittee shall evaluate each of the alternatives developed in accordance with III.C.1 to select the CSO controls that will ensure compliance with CWA requirements.

3. Cost/Performance Considerations. The permittee shall develop and submit cost/performance curves that demonstrate the relationship among the set of CSO control alternatives that correspond to the ranges identified in III.C.1 above.

D. Selected CSO Controls

Once the permittee has selected the CSO controls in consultation with the permitting authority, the permittee shall submit the following:

1. Implementation Schedule. The permittee shall submit a construction schedule for the selected CSO controls as part of the implementation schedule. Such schedules may be phased based on the relative importance of the adverse impacts on water quality standards and on the permittee's financial capability.

2. Operational Plan. The permittee shall submit a revised operation and maintenance plan that addresses implementation of the selected CSO controls. The revised operation and maintenance plan shall maximize the removal of pollutants during and after each precipitation event using all available facilities within the collection and treatment system.

3. Post-Construction Compliance Monitoring Program. The permittee shall develop and submit a post-construction monitoring program that (a) is adequate to ascertain the effectiveness of the CSO controls and (b) can be used to verify attainment of water quality standards. The program shall include a plan that details the monitoring protocols to be followed, including CSO and ambient monitoring and, where appropriate, other monitoring protocols, such as biological assessments, whole effluent toxicity testing, and sediment sampling.

E. Schedule and Interim Deliverables

The following reports shall be developed in accordance with the requirements specified in Sections III.A through III.D and submitted to the permitting authority by the dates specified below:

1. Public Participation Plan, as required in Section III.A, shall be submitted on or before **[insert due date]**.

2. CSS Characterization Monitoring and Modeling Plan, as required in Section III.B, shall be submitted on or before **[insert due date]**.

Exhibit 3-6. Example Permit Language for Requiring the Development of a Long-Term Control Plan (continued)

3. CSS Characterization Monitoring and Modeling Results, including identification of sensitive areas, as required in Section III.B, shall be submitted on or before **[insert due date]**.
4. CSO Control Alternatives Identification, as required in Section III.C.1, shall be submitted on or before **[insert due date]**.
5. CSO Controls Evaluation and Cost Performance Curves for the selected CSO controls, as required in Sections III.C.2 and 3, shall be submitted on or before **[insert due date]**.
6. Implementation Schedule, as required in Section III.D.1, including any supporting analyses, shall be submitted on or before **[insert due date]**.
7. Operational Plan revised to reflect selected CSO controls, as required in Section III.D.2, shall be submitted on or before **[insert due date]**.
8. Post-Construction Compliance Monitoring Plan, as required in Section III.D.3, shall be submitted on or before **[insert due date]**.

development, evaluation, and selection of CSO controls should reduce the potential for delays in the development of the plan, evaluation of control alternatives, and implementation of selected CSO controls, and reduce the risk of unnecessary expenditure of resources by the permittee.

The permittee should be required to prepare and implement a public participation plan. Among the permit writer's options for requiring public participation as a part of LTCP development are the following:

- Requiring the development of a public participation plan at the beginning of the planning process that describes how the public will be involved throughout the process of developing the LTCP. In some cases, the permit writer may want to require the plan to be submitted to the NPDES permitting authority for review. EPA recommends this approach. Example permit language is provided in Exhibit 3-6.

- Generally requiring public participation and periodic reporting of the actual public involvement activities. Alternatively, the permit writer may require reporting at the end of the planning process when the permittee submits its final LTCP.

Regardless of the approach selected, the permit writer may want to specify the type of documentation that should be maintained on public involvement. For example, acceptable documentation may include records of public meetings (including the date, time, location, approximate number of people attending, and key issues), although meeting transcripts would

not necessarily be required. Acceptable documentation may also include summaries of public comments received.

3.5.1.2 Characterization, Monitoring, and Modeling of the CSS and Receiving Waters

Characterization, monitoring, and modeling activities provide the basis for the permittee to choose and design effective CSO controls. According to the CSO Control Policy, the major elements include:

- Examination of rainfall records
- Characterization of the CSS
- Monitoring of CSOs and receiving water quality
- Modeling of the CSS and the receiving water.

As discussed in Section 3.7, initial characterization and monitoring activities are conducted under one of the NMC (monitor to effectively characterize CSO impacts and efficacy of CSO controls). If the permittee has already characterized its CSS, CSOs, and impacts on receiving waters, permit requirements for further characterization may not be necessary (although long-term compliance monitoring will still be necessary, as discussed in Section 3.5.1.9). If the permittee has not sufficiently characterized the system, the permit writer should determine whether further efforts are needed and establish permit conditions that specify the characterization activities necessary to adequately complete this component of the LTCP. EPA's *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA, 1995d) and *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA, 1995a) present technical guidance related to proper CSS characterization.

EPA recommends that the permit writer require the permittee to develop a characterization and monitoring plan that includes the monitoring protocols, procedures, and associated time periods for collection of data that will be used to characterize the CSS and receiving waters. (Section 3.5.2 discusses submittal of the plan and other interim deliverables.) This characterization and monitoring plan should be reviewed by the NPDES permitting

authority, State WQS authority, and EPA Region. As part of this review, these parties should agree on the data, information, and analyses needed to support the development of the LTCP and the review and revisions to WQS and implementation procedures to reflect site-specific wet weather conditions, if appropriate. In addition, the permittee's proposed characterization and monitoring plan should be coordinated with other monitoring efforts within the same watershed. Review and concurrence by these participants should ensure that the permittee collects adequate but not unnecessary characterization and monitoring data.

3.5.1.3 Consideration of Sensitive Areas

Sensitive areas should be identified as part of the CSS characterization as soon as the locations of all CSO outfalls are known. The CSO Control Policy indicates that sensitive areas should be given priority during LTCP development (see discussion in next section). Examples of sensitive areas are provided in the CSO Control Policy and listed in Exhibit 3-7.

Exhibit 3-7. Sensitive Areas Identified in the CSO Control Policy

- Outstanding National Resource Waters
- National Marine Sanctuaries
- Waters with threatened or endangered species
- Waters with primary contact recreation (e.g., swimming)
- Public drinking water intakes
- Shellfish beds

The *initial* identification of sensitive areas should be made by the permittee in consultation with the NPDES permitting authority and may require coordination with local, State, and Federal agencies involved in the protection of such areas. For example, the permittee and permit writer should:

- Coordinate with the U.S. Fish and Wildlife Service to determine whether CSOs occur in waters with threatened or endangered species.
- Coordinate with the local public water utility to ensure the designation of drinking water sources as sensitive areas.

- Evaluate the designated uses of each CSO receiving water because the State might have a designated use that corresponds to a sensitive area as defined by the CSO Control Policy.

The NPDES permitting authority will make the final determination of sensitive areas.

Once sensitive areas have been identified, the permit should require the permittee to give the highest priority to controlling overflows to these areas. Permit conditions should require the LTCP to 1) prohibit new or significantly increased overflows to sensitive areas, 2) eliminate or relocate overflows that discharge to sensitive areas wherever physically possible and economically achievable (except where elimination or relocation would provide less environmental protection than additional treatment), or 3) where elimination or relocation is not physically possible and economically achievable, or would provide less environmental protection than additional treatment, provide the level of treatment for remaining overflows deemed necessary to meet WQS for full protection of existing and designated uses.

Section III.C.1 of Exhibit 3-6 contains example permit language requiring the permittee to consider sensitive areas during LTCP development.

3.5.1.4 Evaluation of Control Alternatives

The primary objective of the LTCP is to evaluate CSO control alternatives that will enable the permittee, in consultation with the NPDES permitting authority, the WQS authority, and the public, to select CSO controls that will meet CWA requirements. To ensure that the most cost-effective and protective CSO controls are selected, the permit writer should require the permittee to consider a reasonable range of CSO control alternatives. The CSO Control Policy encourages the permittee to evaluate CSO control alternatives that provide varying levels of control such as those that would achieve:

- **Example 1**

  - Zero overflow events per year (i.e., total elimination of CSOs via storage and/or sewer separation)
  - An average of 1 to 3 overflow events per year
  - An average of 4 to 7 overflow events per year
  - An average of 8 to 12 overflow events per year.

- **Example 2**

  - Controls that achieve 100-percent capture for treatment
  - Controls that achieve 90-percent capture for treatment
  - Controls that achieve 85-percent capture for treatment
  - Controls that achieve 80-percent capture for treatment
  - Controls that achieve 75-percent capture for treatment.

The permittee should develop an appropriate range of control alternatives based on site-specific conditions.

The CSO control alternatives could include total sewer separation or retention of all combined sewer flows for subsequent treatment during dry weather. The CSO control alternatives also could include a combination of controls for an entire system (e.g., partial sewer separation and retention). In addition, the permittee should consider, among its CSO control alternatives, expanding POTW treatment plant secondary and primary capacity and associated appurtenances to enable additional treatment of combined sewage. Thus, the Phase I permit should require the permittee to evaluate the maximization of treatment at the POTW treatment plant among its CSO control alternatives. EPA's guidance on LTCPs contains additional technical guidance on evaluating CSO control alternatives (EPA, 1995a).

The evaluation of alternatives will ultimately enable the permittee to select CSO controls, in consultation with the NPDES permitting authority, WQS authority, and the public, that, when implemented, will comply with water quality-based requirements of the CWA either through the "presumption approach" or the "demonstration approach." It is unlikely that a permittee or a permit writer will be able to determine the level of control necessary to meet WQS requirements prior to the initiation of the LTCP planning process. Similarly, a permittee will probably not

be able to specifically adopt either the presumption or demonstration approach until after the initial planning process has begun and more is known about its CSS and CSOs. These two approaches (contained in the CSO Control Policy) are described in the following discussion.

Presumption Approach

The presumption approach presumes that the CSO controls necessary to meet the performance criteria presented in the CSO Control Policy will be sufficient to meet the water quality-based requirements of the CWA. The permittee may consider the presumption approach where the level of control needed to protect WQS is unknown, but the permit writer and permittee agree the approach is reasonable based on the data and analysis conducted as part of the characterization. This approach is based on the permittee meeting one of the following criteria presented in the CSO Control Policy:

- No more than an average of four overflow events per year, provided that the NPDES permitting authority may allow up to two additional overflow events per year. Thus, the permit writer may allow four, five, or six overflow events per year. For the purpose of this criterion, the CSO Control Policy defines an overflow event as "one or more overflows from a CSS as the result of a precipitation event that does not receive the minimum treatment specified below."

- The elimination or capture for treatment (as treatment is specified below) of no less than 85 percent by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis. To determine the volume of combined sewage that must be captured or eliminated, the permittee should calculate the total volume entering the combined sewer during precipitation events on a system-wide annual average basis.

- The elimination or reduction of no less than the mass of pollutants identified as causing WQS exceedances through the sewer system characterization, monitoring, and modeling effort for the volume(s) that would be eliminated or captured for treatment, as described under the previous bullet. Again, the permittee, in consultation with the permit writer, should determine the appropriate volume of combined sewage to be treated. In addition, the permittee, in consultation with the permit writer, should identify the specific pollutants and their masses to be eliminated or reduced.