ECONOMIC ANALYSIS OF THE PROPOSED REGULATIONS ADDRESSING NPDES PERMIT REQUIREMENTS FOR MUNICIPAL SANITARY SEWER COLLECTION SYSTEMS, MUNICIPAL SATELLITE COLLECTION SYSTEMS AND SANITARY SEWER OVERFLOWS

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EXECUTIVE SUMMARY

EPA is proposing revisions to existing National Pollutant Discharge Elimination System (NPDES) regulations governing municipal sanitary sewer collection systems, municipal satellite collection systems and sanitary sewer overflows (SSOs). The proposed revisions, which were developed in close consultation with the SSO Federal Advisory Subcommittee, serve two primary objectives. First, they reiterate and clarify existing regulatory requirements in order to provide a distinct and unified set of SSO program requirements. Second, they add new administrative and planning requirements that will create a comprehensive regulatory program for collection systems. The entire program will: 1) Enhance the certainty and efficiency with which sanitary sewer collection systems achieve the Clean Water Act (CWA) standard of no unauthorized discharge; and 2) Elicit the information, planning, analysis and legal authorities that will facilitate prudent management of collection systems as an invaluable capital asset.

This document estimates the incremental costs, benefits and economic impacts of the new requirements included in the proposed regulation. The proposed new requirements address the full range of managerial issues relating to sanitary sewer collection systems and SSOs: reporting, public notification, operation and maintenance planning, capacity assurance, and training. In addition, the proposed regulation clarifies the existing prohibition on unauthorized discharges from sanitary sewer collection systems to waters of the U.S.; clarifies certain existing record keeping and reporting requirements; and clarifies the applicability of NPDES requirements to "satellite" collection systems (collection systems that discharge to other collection systems rather to POTWs).

The regulation needs to be issued for several reasons. First, the roughly 40,000 SSOs that now occur each year pose significant risks to human health and the environment. SSOs are estimated to cause more than a million cases of illness per year in the U.S. Calculations based on State water quality assessments developed under Section 305(b) of the CWA indicate that SSOs impair as much as 1 - 2 % of all waters nationwide, causing substantial losses in recreational and ecological values. An additional $ 258 - $ 643 million in annual economic losses and cleanup costs result from SSOs that release sewage into basements, streets, and other locations. The great majority of these SSOs are unauthorized. But without comprehensive and proactive planning for sanitary sewer collection system operation, maintenance, management and capacity, many communities will continue to experience excessive SSOs. The proposed rule will create a framework of planning and evaluation requirements that will help communities to manage their collection systems with greater efficiency and effectiveness. In conjunction with investments in system capacity, storage, infiltration and inflow reduction, and operation and maintenance (the costs of which are addressed in a separate SSO "Needs Report"), the new and clarifying provisions in the proposed rule are necessary to reduce the number and impact of SSOs.

Second, sanitary sewer collection system infrastructure represents a major public investment valued at approximately $1 - 2 trillion. In many cases, this is one of the largest public investments within a

community, with funding from local, State and Federal sources. The proposed rule creates a planning framework designed to help optimize the upkeep and longevity of this existing infrastructure. The proposal will help communities to prioritize these investments, making them more efficient. By helping communities improve the operation and maintenance of their sanitary sewer collection systems, the proposed rule helps protect the huge Federal, State and local investments that have gone into these systems.

Third, the existing regulatory requirements pertaining to collection systems and SSOs have been inconsistently applied by some State NPDES authorities and permittees. The proposed regulation clarifies existing regulations, reorganizes them and supplements them with additional requirements in order to develop a comprehensive, easily understandable program for collection systems and SSOs. The result will be much more consistent interpretation of regulatory requirements by oversight authorities and much more consistent performance by permittees. In clarifying existing requirements, the proposed regulation seeks to be consistent with the objectives of the President's Memorandum on Plain Language in Government Writing.

Approach for Estimating Costs and Benefits of the Proposed Rule

The impacts of the proposed regulation are estimated relative to a baseline of full compliance with existing CWA and NPDES requirements. The costs and benefits of the proposed rule thus consist of the incremental impacts resulting from moving from a baseline in which compliance is assumed with existing requirements to a new "state-of-the-world" in which compliance is assumed with the requirements set forth in the proposed rule With the baseline defined in this manner, this analysis focuses on and isolates the incremental impacts resulting specifically from the proposed rule.

Separately from this Economic Analysis, EPA is publishing other documents that estimate the economic costs of compliance with existing statutory and regulatory requirements for municipal sanitary sewer collection systems and the economic benefits associated with abating SSOs. The "Needs Report" estimates the national investments needed to improve collection system performance from current levels to virtually no SSOs, or essentially to compliance with the existing Clean Water Act prohibition on SSOs. The "Benefits Report" estimates the benefits of investing in collection systems and also abating all SSOs. This Economic Analysis addresses the increments that the proposed regulations would add beyond existing regulatory requirements. Note particularly that the costs estimated in the Needs Report are separate and distinct from the costs associated with the proposed rule.

In addition to considering the baseline of existing requirements, the cost analysis for the proposed rule also considers whether, and to what extent, municipalities already now perform activities set forth in the proposed rule even though they are not currently required by Federal regulations. There are a variety of reasons why some or all communities might currently be performing an action that is not required by Federal regulations -- perhaps some forward-looking communities have foreseen that the action will be

advantageous; or perhaps some States already require the action. Field data, collection system benchmarking studies, surveys of practice, and other industry sources have been consulted in order to determine the extent to which communities may already be meeting some of the new requirements in the proposed regulation. In instances where a community is already performing an activity that would be newly required by the proposed rule, the community will not incur any incremental costs in order to comply with the new requirement. In order to account for current practices by communities that go beyond the baseline of existing Federal requirements, the cost analysis in this document measures the incremental costs of the proposed rule relative to the higher of:

a) Existing Federal regulatory requirements; or

b) Current practice by the regulated community.

The proposed rule includes many provisions that simply restate, reorganize and clarify existing NPDES regulatory requirements. These proposed clarifying provisions are included in the regulation in order to bring together in one place a comprehensive, easily understandable set of general performance standards for municipal sanitary sewer collection systems. The clarifying provisions do not add any new substantive requirements. This Economic Analysis includes a detailed comparison of existing regulatory requirements and the proposed rule's clarifying provisions in order to demonstrate that they do not impose requirements that do not already exist. Based on this review, no incremental compliance costs are attributed to the clarifying provisions in this rulemaking.

Other provisions in the proposed regulation, however, do impose new requirements for sanitary sewer collection systems addressing record keeping, reporting, public notice, planning, management, capacity assurance, legal authorities, training, performance evaluation, audits, and communications. In addition, applicability of all requirements to satellite collection systems is made clear.

The costs of all the proposed new requirements are estimated in a step-wise manner. For each new regulatory requirement, specific tasks are identified that regulated entities or oversight authorities would need to accomplish in order to comply with the requirement. Estimates are developed for the unit costs of each task (e.g., labor hours, equipment and material requirements needed to perform the task one time) and how often the task would need to be accomplished by the entity. In most cases, available data indicates that the unit cost and/or the frequency with which the task must be performed increases with increasing size of the collection system. Ultimately, the nationwide total cost for a provision is calculated by multiplying the per-system cost for systems of a given size range by the number of systems of that size range in the nation and then aggregating across the different system size ranges. The cost estimates are adjusted to reflect instances in which some or all communities may already be performing an action in advance of it being required by Federal regulation. Both capital (one-time) and annual (ongoing) costs are estimated, and they are then combined in an annualization procedure.

The cost estimates reflect assumptions about the timing and applicability of the proposed new requirements. Most new requirements are assumed to be made applicable to a system at the time at which the system's NPDES permit is renewed. NPDES permits have a five year term and permit expirations and renewals are assumed to occur at an even pace over the next five years. Thus 20 % of all systems are assumed to become subject to the rule's requirements in the first year after promulgation, another 20 % in the second year, etc.. The cost estimates also reflect the flexibility in compliance deadlines proposed in the rule for several requirements. Smaller sanitary sewer collection systems are allowed varying periods of time to come into compliance after a requirement is written into a system's permit. The cost estimates also reflect the possibility of some requirements being waived for systems that show an exemplary performance record (e.g., systems that have no SSOs for some period of time).

Estimated Costs of the Proposed Rule

The annualized costs of the new requirements in the proposed rule are estimated at $93.5 to $126.6 million annually (1999 dollars). These costs result from the major provisions of the proposed rule as follows:

Table ES-1: Incremental annual costs of major provisions

Provision	Cost (lower estimate)	Cost (upper estimate)
Record keeping and reporting	$8,974,600	$8,974,600
Public notification	$7,097,294	$7,097,294
CMOM general standards	$3,914,440	$4,638,029
CMOM management program	$46,237,464	$66,074,838
CMOM overflow response plan	$8,212,482	$18,353,309
CMOM system evaluation and capacity assurance plan	$10,403,442	$10,603,379
CMOM program audits	$4,446,735	$6,714,556
CMOM communications	$3,640,973	$3,640,973
Permitting of satellite collection systems	$58,153	$58,153
Cost to oversight authorities	$491,515	$491,515
Total	**$93,477,097**	**$126,647,196**

The most costly elements are several components necessary to implement the required CMOM

management program: assessment of the adequacy of current collection system capacity and pinpointing areas that may have hydraulic deficiencies ($23.2 million annually); and training for permittee personnel to ensure appropriate performance of CMOM management program functions ($16.4 million annually).

The great majority of sanitary sewer collection systems serve small communities, and these smaller systems will incur the bulk of the estimated national compliance costs. The costs per system, however, increase with the size of the system. It is possible that these new costs will be passed through to sewer rate payers in their respective communities.

Table ES-2: Distribution of costs by community size

Community Size	Number of Systems	Population Served	Total Cost/yr (in millions)	Avg. Cost per System	Avg. Annual Cost Per Household
< 10,000	16,359	29,000,000	$43.3 - $64.6	$2,646- $3,109	$4.87
10,000 to 24,999	1,632	25,300,000	$16.8 - $23.4	$10,313 - $14,332	$2.08
25,000 to 49,999	604	21,100,000	$9.2 - $10.5	$15,182 - $17,399	$1.19
50,000 to 249,000	396	40,800,000	$15.2 - $ 18.5	$38,486 - $46,703	$1.03
250,000 to 499,999	30	11,100,000	$3.1 - $3.4	$103,710 - $112,579	$0.75
500,000 to 999,999	15	10,800,000	$2.9 - $3.2	$193,681 - $215,227	$0.74
> 1,000,000	4	9,900,000	$2.4 - $2.6	$612,251 - $645,016	$0.66
all communities	19,040	148,000,000	$93.0 - $126.2	$4,884 - $6,626	$1.92

The costs of the rule per household represent a very small percentage increase in current average household spending for sewer service. For households in communities of less than 10,000, the rule may result in an increase in expenditures for sewer service of at most 2.2 - 2.9 %. For the largest communities, the increase will be at most 0.4 - 0.6 %, and for all communities the increase will be 0.9 - 1.2 % at most.

A separate analysis has been performed to investigate the potential impacts of the rule on small entities. The rule affects small governmental entities, defined as the government of a city, county, town, school district, or special district with a population of less than 50,000 which does not pass through costs to sewer rate payers. 98 percent of all sanitary sewer collection systems are owned by small governmental entities as thus defined. The small entity analysis concludes that compliance costs will average much less than 1 % of governmental revenues for all classes of small governmental entities (< 10,000, 10 - 25 thousand, 25 - 50 thousand) in all States.

Estimated Benefits of the Proposed Rule

Due to the nature of the proposed SSO regulations, the approach to analyzing benefits and costs in this Economic Analysis (EA) differs from the approach taken in most EAs. Typically, a proposed regulation includes both a new regulatory standard and the administrative and technical requirements necessary to meet that standard. An EA for such a rule assesses both the costs of the pollution prevention and control measures necessary to meet the standard, and any administrative costs to both regulated entities and federal/state implementing agencies. The EA then compares the benefits of achieving the standard with the total costs of the rule, including administrative costs.

The proposed SSO regulations depart from this model in that the regulatory standard (no unauthorized discharges) has already been established. Achievement of this existing standard will result in fewer SSOs, improved water quality, and a wide range of quantifiable benefits. Achieving this existing standard will require investments by communities in infiltration and inflow control, additional capacity, and enhanced operation and maintenance programs for their collection systems. Achieving this existing standard will also require strengthened planning, management, reporting and oversight programs. The proposed SSO regulations provide for these planning, management, and reporting needs, while leaving the existing regulatory standard (no unauthorized discharges) unchanged. In effect, both the existing regulatory standard (with associated infrastructure costs) and these new administrative provisions to implement the standard (with associated costs for planning, reporting, etc.) are necessary to achieve the benefits of fewer SSOs and cleaner water. Both varieties of spending are jointly needed to achieve this set of benefits. There is considerable latitude in determining how to allocate the total benefits of fewer SSOs and cleaner water among the two sorts of spending needed to achieve the benefits. For this EA, the SSO-reduction and water quality benefits of the proposed rule are accounted for by allocating benefits proportionally -- we attribute to this rulemaking a share of total SSO-reduction and water quality benefits equal to the share of total costs that this rulemaking constitutes.

The monetized benefits of achieving the standard of no unauthorized SSOs have been estimated in the Benefits Report as $ 1.07 - $ 6.1 billion annually, with $1.0 - $5.5 billion of these benefits from

improved water quality and SSO abatement.[1] The annualized cost of investments by sanitary sewer collection systems in increased capacity and intensified O & M that are needed to achieve virtually no SSOs are estimated in the Needs Report as $ 6.8 - $ 9.8 billion annually. The incremental costs of this proposed rule, which EPA judges as also necessary to achieve this standard, total $ 93.5 - $ 126.6 million annually. The proposed rule thus accounts for 1.2 to 1.4 % of the total costs needed to achieve the standard. If a similar share of the estimated $ 1.0 - $ 5.5 billion in quantified water quality and SSO abatement benefits is allocated to this rule, the estimated benefits attributable to the rule specifically are $12 million - $74 million annually.

The proposed SSO regulations also create another set of benefits -- cost savings for sanitary sewer collection systems associated with better, more targeted, more efficient operation and maintenance programs. This separate set of benefits is derived exclusively from the proposed SSO rule, and is obtained independent of the investments by collection systems that are projected in the Needs Report as necessary to meet the existing "no unauthorized discharge" standard. The proposed rule will encourage collection systems to redirect their baseline O&M programs to optimize system efficiency and effectiveness. Benefits will result in the form of reductions in total spending on collection system operations and maintenance.

Sanitary sewer collection systems currently spend an estimated $1.6 billion annually for O&M. The Needs Report estimates that approximately $1.5 billion annually in additional O&M spending will be needed in order for all communities to comply with existing CWA and NPDES requirements. Applying the findings of the Water Environment Research Foundation's 1997 collection system benchmarking study, it is estimated that "smarter" O&M practices as prompted by the proposed regulation could reduce this $3.1 billion/year baseline level of collection system O&M spending by 0.77 %. This results in a national estimate of about $23.9 million annually in savings from smarter O&M attributable to the proposed rule.

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[1] Details on the methodology and conclusions of the SSO benefits analysis are provided in the Benefits Report and are not repeated in the Economic Analysis. The most important categories of monetized benefits comprising the $ 1.0 - $ 5.5 billion estimate are: reductions in swimmer illnesses, increased beneficial uses that can be made of cleaner water, and reduced property damage and clean-up costs with fewer SSOs. In addition, $ 82 - $ 637 million/year in eventual cost savings for collection systems are estimated to result from the increased spending on system maintenance that is one of the elements needed for SSO abatement. These "systems benefits" are discussed in the Benefits Report, but they are not included here among the benefits that we allocate a portion of to the rule. We exclude systems benefits from the proportional allocation calculation so as to avoid any possibility of double-counting in attributing to the rule both a share of systems benefits and the benefits of "smarter O&M"(to be discussed on the next page). The quantified estimates of all these benefits are quite uncertain, as many of the benefits estimates rely on extrapolating to a broad, nationwide context the data and relationships that were developed in studies of particular situations. The Benefits Report also notes extensive benefits from reducing SSOs that could not be quantified and monetized. These additional benefits are important, despite their not having been quantified.

Table ES-3: Monetized benefits of the proposed SSO rule

Benefits category	Estimated annual monetized benefits	
	lower estimate	upper estimate
Benefits of fewer SSOs and improved water quality	$ 12,200,000	$ 73,900,000
Savings from "smarter" O&M programs	$ 23,900,000	$ 23,900,000
TOTAL	**$ 36,100,000**	**$ 97,800,000**

Additional benefits can be expected that have not been monetized. The Benefits Report discusses a wide variety of non-monetized benefits from the water quality improvements expected with fewer SSOs. "Smarter" O&M programs will result in savings in O&M costs as quantified, but will also result over the longer term in improved capacity planning and unquantified opportunities for savings in capital investments. Furthermore, as EPA assists in disseminating information on innovative, highly efficient management strategies that are developed in particular communities, the savings from smarter O&M will increase in the future as more communities adopt these successful strategies.

Comparison of Benefits and Costs

The estimated costs of the proposed rule are $93 - $127 million annually. The estimated monetized benefits range from $36 - $98 million annually. These monetized benefits thus appear to be of the same general order of magnitude as the costs of the rule. In addition, EPA was not able to monetize several important sorts of benefits.

Table ES-4: Comparison of benefits and costs of the proposed SSO rule

Benefits of the rule: monetized	$ 36,000,000 to $ 98,000,000 per year
non-monetized	xxx
Costs of the rule	$ 93,000,000 to $ 127,000,000 per year

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1. INTRODUCTION

EPA is proposing revisions to existing National Pollutant Discharge Elimination System (NPDES) regulations governing municipal sanitary sewer collection systems and sanitary sewer overflows (SSOs). The proposed revisions, which were developed in close consultation with the SSO Federal Advisory Subcommittee, serve two primary objectives. First, they reiterate and clarify existing regulatory requirements in order to provide a distinct and unified set of SSO program requirements. Second, they add new administrative and planning requirements that will create a comprehensive regulatory program for collection systems. The entire program will: 1) Enhance the certainty and efficiency with which sanitary sewer collection systems achieve the Clean Water Act (CWA) standard of no unauthorized discharge; and 2) Elicit the information, planning, analysis and legal authorities that will facilitate prudent management of collection systems as an invaluable capital asset.

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The regulation needs to be issued for several reasons. First, the roughly 40,000 SSOs that now occur each year pose significant risks to human health and the environment. SSOs are estimated to cause more than a million cases of illness per year in the U.S. Calculations based on State water quality assessments developed under Section 305(b) of the CWA indicate that SSOs impair as much as 1 - 2 % of all waters nationwide, causing substantial losses in recreational and ecological values. An additional $ 258 - $ 643 million in annual economic losses and cleanup costs result from SSOs that release sewage into basements, streets, and other locations. The great majority of these SSOs are unauthorized. But without comprehensive and proactive planning for sanitary sewer collection system operation, maintenance, management and capacity, many communities will continue to experience excessive SSOs. The proposed rule will create a framework of planning and evaluation requirements that will help communities to manage their collection systems with greater efficiency and effectiveness. In conjunction with investments in system capacity, storage, infiltration and inflow reduction, and operation and maintenance (the costs of which are addressed in a separate SSO "Needs Report"), the new and clarifying provisions in the proposed rule are necessary to reduce the number and impact of SSOs.

Second, sanitary sewer collection system infrastructure represents a major public investment valued at approximately $1 - 2 trillion. In many cases, this is one of the largest public investments within a

community, with funding from local, State and Federal sources. The proposed rule creates a planning framework designed to help optimize the upkeep and longevity of this existing infrastructure. The proposal will help communities to prioritize these investments, making them more efficient. By helping communities improve the operation and maintenance of their sanitary sewer collection systems, the proposed rule helps protect the huge Federal, State and local investments that have gone into these systems.

Third, the existing regulatory requirements pertaining to collection systems and SSOs have been inconsistently applied by some State NPDES authorities and permittees. The proposed regulation clarifies existing regulations, reorganizes them and supplements them with additional requirements in order to develop a comprehensive, easily understandable program for collection systems and SSOs. The result will be much more consistent interpretation of regulatory requirements by oversight authorities and much more consistent performance by permittees. In clarifying existing requirements, the proposed regulation seeks to be consistent with the objectives of the President's Memorandum on Plain Language in Government Writing.

This Economic Analysis estimates the costs, benefits and economic impacts of the proposed SSO regulations. Each proposed provision is categorized as "clarifying" -- restating or reorganizing an existing regulatory requirement -- or as "new" -- adding a requirement that is not encompassed within existing regulations. Clarifying provisions impose no incremental compliance costs. Incremental compliance costs are estimated for each of the new provisions. The costs of complying with the proposed new provisions are estimated for the nation as a whole, for average communities of various sizes, and for households in these communities The EA also includes analyses of the proposed rule's impacts on small entities and Tribes. Two broad sorts of benefits are estimated for the proposed rule: those stemming from the reduction in the number of SSOs expected to occur, and those relating to the increased efficiency of sanitary sewer collection system management that will be instigated by the rule.

The Economic Analysis document is organized in eight sections, as follows:

C 1. Introduction

C 2. Statutory and regulatory framework. This section provides background and context for the proposed regulations. It also describes the current regulatory requirements applicable to sanitary sewer collection systems and summarizes the proposed regulation.

C 3. Need for the proposed regulation. The rationale for the proposed Federal regulations is described.

C 4. Baseline from which the costs and benefits of the proposed rule are measured. This section defines the baseline as full compliance with existing CWA and NPDES requirements. The

proposed provisions that only clarify existing regulatory requirements are identified.

- 5. Costs of the proposed rule. The general procedures used in estimating the costs of the proposed new provisions are described. The section then summarizes the steps and results in estimating costs for each provision. Costs are also estimated for communities of different sizes and for households. Costs to State and Federal oversight authorities are estimated, in addition to the costs for communities.

- 6. Benefits of the proposed rule. Incremental benefits are estimated, drawing largely on the separate Benefits Report.

- 7. Analysis of alternatives. Several broad alternatives that were considered by the Agency are discussed and contrasted with the approaches that have been chosen.

- 8. Additional analyses. This section estimates the impacts of the proposed rule on small entities and on Native American Tribes.

- Appendices. Three appendices are provided, addressing: A) Detailed explanation of the bases for categorizing specific provisions in the proposed rule as clarifying; B) Detailed description of the costing methodology for each new provision in the proposed rule; C) Detailed cost tables by provision and community size.

Separately from this Economic Analysis, EPA is publishing another document that estimate the economic costs of achieving compliance with existing statutory and regulatory requirements for municipal sanitary sewer collection systems. The "Needs Report" estimates the national investments needed to improve collection system performance from current levels to virtually no SSOs, or essentially to compliance with the existing Clean Water Act prohibition on SSOs. In addition, EPA is publishing a "Benefits Report" which estimates the benefits of achieving total SSO abatement. This Economic Analysis addresses the increments that the proposed regulations would add beyond existing regulatory requirements. Note particularly that the costs estimated in the Needs Report are separate and distinct from the costs associated with the proposed rule.

2. STATUTORY AND REGULATORY FRAMEWORK

2.1 Background

In 1972, under the authority of the Federal Water Pollution Control Act (later called the Clean Water Act (CWA)), the Environmental Protection Agency (EPA) developed the National Pollutant Discharge Elimination System (NPDES) permit program to control pollutant discharges to the Nation's waters from industrial, commercial, and municipal point sources. For the subsequent decade and more, EPA focused its efforts in standards development, permitting and enforcement on industrial manufacturing facilities and publicly owned treatment works (POTWs) -- traditional point sources with relatively continuous discharges. As discharges from traditional point sources became progressively better controlled, though, it became apparent that a large share of the Nation's remaining water quality problems were due to more diffuse nonpoint sources and to sources with non-continuous and intermittent discharges.

Throughout the 1980s, increasing attention was devoted to controlling sources where pollution is transported into water bodies by precipitation events, such as rainfall and snowmelt. These precipitation-related sources of pollution are referred to as "wet weather discharges." EPA's 1992 National Water Quality Inventory Report to Congress noted that pollution from wet weather discharges was cited by States as the leading cause of water quality impairment. Wet weather discharges in rural areas can derive from such sources as agriculture and silviculture. In urban areas, the most important varieties of wet weather discharges include: 1) Storm water from municipal, industrial and construction activities; 2) Sanitary sewer overflows (SSOs); and 3) Combined sewer overflows (CSOs), which occur during wet weather events in some cities that have combined sanitary and storm sewers. This proposed regulation addressing SSOs represents the last in a planned series of EPA regulations and policies addressing these three varieties of urban wet weather discharges.

To respond to the threats to water quality, aquatic life, and human health posed by urban wet weather discharges, EPA has already promulgated two rulemakings addressing storm water discharges and the CSO Control Policy. In 1990, EPA developed Phase I of the NPDES Storm Water Program, pursuant to the 1987 amendments to the Clean Water Act calling for implementation of a comprehensive national program for addressing problematic non-agricultural sources of storm water discharges. Phase I requires NPDES permits for municipal separate storm water systems (MS4s) serving large- and medium-sized communities (those with over 100,000 inhabitants), and for storm water discharges associated with industrial activity, including construction activity disturbing at least five acres of land. These permits require the implementation of storm water management plans and programs as necessary to protect and improve water quality.

In 1994, EPA issued the CSO Control Policy, which calls for communities with combined sewer systems to take immediate and long-term actions to address CSO problems. Measures specified in the

policy include proper operation and regular maintenance of combined sewer systems as well as reporting and public notification when CSOs occur.

In October, 1999, EPA promulgated a Storm Water Phase II regulation. The Phase II Rule requires two additional sorts of storm water sources -- discharges from certain regulated small MS4s (primarily all those located in urbanized areas) and construction activity disturbing between 1 and 5 acres of land -- to obtain NPDES permits. The rule subjects these sources to more flexible but generally similar storm water management requirements as were required for the sources covered under Phase I, but through general permits rather than individual permits.

In addition to these actions for storm water discharges and CSOs, EPA took several steps to address the problem of sanitary sewer overflows. In late 1994, a number of municipalities approached the EPA Office of Water asking the Agency to establish a Federal Advisory Committee (FAC) of key stakeholders to make recommendations on how the NPDES program should address SSOs. In response, EPA convened in 1994 a national "SSO policy dialogue". The policy dialogue was reconvened in 1995 as the SSO Subcommittee to the Urban Wet Weather Flows Federal Advisory Committee, which was chartered with the goal of developing specific recommendations for addressing crosscutting wet weather issues and improving the effectiveness of the Agency's various efforts to address wet weather pollutant sources under the NPDES program. Representatives were selected for an SSO Subcommittee with balanced representation across States, municipalities, counties, various wastewater industry associations, and environmental and citizens' groups.

The SSO Subcommittee held ten meetings between December, 1994 and December, 1996. During that time, the SSO Subcommittee identified and explored a number of complex issues and concerns. The Subcommittee developed a consensus document, as well as several non-consensus documents. In 1997, EPA suspended discussions with the SSO Subcommittee to give the Agency time to progress in resolving key issues and concerns raised during the Subcommittee's discussions.

In May, 1999, EPA distributed draft papers to the SSO Subcommittee suggesting a broad set of policy approaches for SSOs and a draft group of standard NPDES permit conditions relevant to SSOs that would be proposed for inclusion in all permits for POTWs and sanitary sewer collection systems. The 1999 EPA approach was generally consistent with the consensus document originally developed by the Subcommittee.

On May 29, 1999, President Clinton directed EPA to improve protection of public health at our nation's beaches by developing, within one year, a strong national regulation to prevent SSOs. Subcommittee meetings were held in July and October to discuss the draft papers. At the October meeting, the SSO Subcommittee unanimously supported, when taken as a whole and recognizing that they are interdependent, the basic principles expressed in EPA's documents. The Subcommittee agreed that

an SSO regulation should include: 1) a required program for each municipal sanitary sewer collection system addressing capacity, management, operation and maintenance (CMOM); 2) a prohibition on SSOs; 3) reporting, record keeping and public notification requirements for municipal sanitary sewer collection systems and SSOs; and 4) clarification of requirements regarding satellite collection systems. These are the key elements of the regulation that EPA is now proposing.

2.2 Existing Statutory and Regulatory Requirements

2.2.1 General prohibition on unauthorized discharges from sanitary sewer collection systems

Section 402 of the Clean Water Act (33 U.S.C. 1311(a)) prohibits point source discharges of pollutants to waters of the United States that are not authorized by a NPDES permit. EPA assumes that discharges from a sanitary sewer collection system to waters of the United States contain pollutants, and are made via a point source conveyance. Whether or not a specific SSO constitutes a violation of an NPDES permit depends on the particular permit language and circumstances under which the discharge occurs. Permits for POTW discharges generally prohibit discharges from a sanitary sewer collection system that are not in compliance with secondary treatment standards or more stringent water quality-based effluent limits (see 40 CFR 122.1, 122.2, and 122.44; 40 CFR 133.102).

In addition, some categories of wastewater releases that do not reach waters of the United States are also indicators of an NPDES permit violation. These include releases from manholes and other portions of the collection system as well as wastewater backups into buildings if the cause of the backup is due to improper operation or maintenance by the permittee. Such releases may be evidence that the permittee is not complying with another standard NPDES permit condition discussed below: the duty to properly operate and maintain all facilities and systems (40 CFR 122.41(e)).

2.2.2 Requirements to operate and maintain the collection system

This standard condition that must be included in all NPDES permits requires proper operation and maintenance of permitted wastewater systems and related facilities so as to achieve compliance with all other permit conditions (40 CFR 122.41(e)). In addition, another standard condition requires the permittee to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment (40 CFR 122.41(d)). This second condition is known as the "duty to mitigate" clause. The combination of these two provisions with the prohibition on SSOs to waters of the United States requires permittees to provide capacity in their sanitary sewer collection systems that is adequate to avoid SSOs.

2.2.3 Record keeping and reporting requirements

The standard permit condition at 40 CFR 122.41(j)(2) requires permittees to retain copies of all reports required by the permit for a period of at least 3 years from the date of the report. Reports required by the NPDES permit include the required noncompliance reports of SSO events which result in discharges to waters of the United States. The existing NPDES standard conditions also require permittees to report any noncompliance event to the NPDES authority (40 CFR 122.41(l)(6) and (7)). A release of wastewater from a sanitary sewer collection system (that occurs prior to the headworks of a treatment plant) that discharges to waters of the United States constitutes noncompliance which must be reported in accordance with these provisions. These provisions require that all noncompliance events must be reported, either orally or by written submission or both.

2.2.4 Applicability of requirements to satellite collection systems

Satellite collection systems are collection systems that typically discharge to a regional collection and treatment system that is owned and operated by an entity that is different than the owner and operator of the satellite system. Operators of satellite sanitary sewer collection systems typically do not operate a treatment plant for some or all drainage areas, but instead rely on the operator of the regional system to provide wastewater treatment and discharge the resulting effluent.

Under current regulations, only permittees are required to comply with an NPDES permit. However, requirements such as the duty to properly operate and maintain the system can be extended also to satellite collection systems if the satellite operator is made a permittee. Individual permits may also contain more specific requirements. Although many satellite collection systems are currently not covered by an NPDES permit, any discharge to waters of the U.S. from a satellite system to waters of the United States without an NPDES permit is nevertheless prohibited under CWA Section 402.

2.3 Requirements in the Proposed Regulation

The proposed regulation contains several provisions whose major purpose is to reiterate, reorganize, and clarify existing regulatory requirements and performance standards. These clarifying provisions were included in the regulation to provide a more unified, comprehensive set of SSO program requirements. At present, the set of existing requirements for sanitary sewer collection systems is spread across a number of different regulations. The proposed regulation seeks to clarify existing requirements by restructuring them into a single cohesive, comprehensive package.

The proposed rule also contains a number of provisions which would impose new planning and administrative requirements. These requirements were crafted in close consultation with the SSO Federal Advisory Subcommittee, and are intended to 1) improve the ability of NPDES authorities to provide regulatory oversight in a technically sound manner; and 2) ensure that NPDES collection systems are prepared and able -- through the use of efficient, proactive, system-specific management approaches --

to meet the existing legal standard of no unauthorized SSOs.

The distinction between clarifying provisions and provisions imposing new administrative requirements is examined in section 4. Section 5 provides an overview as well as detailed topic-by-topic review of the incremental costs associated with the new administrative requirements in the rule.

This subsection summarizes the provisions contained in each of the four major topic areas addressed by the proposed regulation:

1) Record Keeping, Reporting and Public Notification;

2) Capacity, Management, Operation and Maintenance (CMOM);

3) Prohibition on Discharges;

4) Satellite Collection Systems.

2.3.1 Record keeping, reporting and public notification

The proposed rule clarifies existing requirements to keep records regarding SSOs and report those that occur via 24-hour reports, follow-up written reports, and Discharge Monitoring Reports. The proposed regulations also add new requirements for the permittee to maintain records, for the most recent 3 years, of SSO-related work orders, customer complaints, and performance and implementation measures. Permittees are also required to provide notice to the public, health agencies, and other affected entities of overflows that may imminently and substantially endanger human health, and to submit annual summary reports of all overflows from their collection systems. These requirements are intended to improve program efficiency, improve oversight by the NPDES authority, and give the public information about specific events and performance trends.

2.3.2 Capacity, management, operation and maintenance (CMOM)

The proposed CMOM approach in the proposed regulation would establish a process and framework for continual improvement in collection system performance and management. The proposed CMOM framework is intended to help create a dynamic system management approach that encourages prioritizing efforts to identify and correct performance-limiting situations in the collection system. Under this proposed framework, municipalities are required to evaluate -- and where necessary, modify -- the manner in which they manage, operate and maintain their systems.

The proposed CMOM provisions on standard conditions help clarify existing standard conditions

for proper operation and maintenance. Although the proposed requirements generally do not identify specific details of activities that must be undertaken, they do provide documentation requirements and a framework for evaluating the comprehensiveness of operations and maintenance programs. This framework is the CMOM program, under which permittees must perform a number of critical planning and prioritization tasks. Permittees are also required to develop and implement an overflow response plan that provides procedures for ensuring appropriate response to overflow events, as well as reporting and notification.

Other proposed CMOM requirements include a system evaluation and capacity assurance plan, CMOM program audits, and CMOM communication requirements. If peak flow conditions contribute to an SSO discharge, permittees are generally required to develop and implement a system evaluation and capacity assurance plan. The plan, which must be updated regularly, must include steps to identify hydraulic deficiencies which contribute to SSOs, and short- and long-term actions to address each hydraulic deficiency. The proposed CMOM program audit provisions require permittees to conduct periodic audits and present the results of each audit in a report. The report must evaluate the CMOM program, evaluate compliance with the program requirements, identify deficiencies in the CMOM, and set forth steps to respond to these deficiencies. Under proposed CMOM communication requirements, permittees are encouraged to communicate with interested parties on a regular basis regarding the implementation and performance of their CMOM program.

The proposed CMOM requirements are tailored in various ways to reflect the size and performance record of permittees. Smaller systems (those serving less than 10,000 people, and those serving 10 - 50 thousand people) may be allowed a longer period than larger systems for meeting the CMOM documentation requirements (summary of CMOM program, overflow response plan, program audit report, system evaluation and capacity assurance plan, if required). Systems serving less than 25,000 people need not prepare these documents unless they have an SSO event, in which case they must prepare them within a year following the discharge. Permit writers may generally establish less detailed CMOM requirements for very small systems.

2.3.3 Prohibition on municipal sanitary sewer system discharges

The proposed regulation clarifies the existing general prohibition on discharges by specifying that discharges occurring prior to a publicly owned treatment works (POTW) treatment facility are prohibited, and that the bypass and upset provisions in existing regulations do not apply to these discharges. The proposed regulation specifies the conditions under which 1) discharges caused by severe natural conditions, and 2) discharges caused by other factors may be exempted from enforcement action.

2.3.4 Satellite collection systems

The proposed provisions addressing satellite collection systems would clarify the existing Federal requirement to report SSOs to waters of the United States. The Federal reporting requirement will be contained in a permit issued to the owner of the municipal satellite collection system. Proposed satellite provisions also clarify that NPDES permits must require that CMOM programs be implemented in all municipal satellite collection systems. The permittee responsible for CMOM program implementation in a municipal satellite collection system may either be: 1) the owner of the municipal satellite collection system; or 2) the regional collection system that accepts flows from the municipal satellite collection system. Specific responsibilities would be clarified on a case-by-case basis. Permits for municipal satellite sanitary sewer collection systems would contain the standard permit conditions for reporting, record keeping, public notification, and CMOM programs and the prohibition on SSO discharges.

3. NEED FOR THE PROPOSED REGULATION

The proposed regulation is intended to address three interrelated issues: 1) The environmental problems caused by SSOs; 2) The need to protect and enhance local, State and Federal investments in sewer system infrastructure; and 3) The need to provide a clear and consistent regulatory program for collection systems.

3.1 Environmental Problems Caused by SSOs

EPA estimates that roughly 40,000 SSO events occur each year that release raw sewage to the general environment, and perhaps ten times this many instances occur where sewage backs up into basements. These events lead to a variety of damages:

- Exposure of people to health risks. SSOs contain untreated sewage and therefore high concentrations of disease-causing pathogens. SSOs contaminate beaches, drinking water, shellfish beds and basements, and people can become ill after exposure to pathogens from SSOs in any of these locations. Calculations presented in the Benefits Report accompanying the proposed rule suggest that SSOs are responsible for more than a million cases of illness per year in the U.S. A case study presented in the report documents an instance in which more than 1,300 people became ill from a single SSO event.

- Lowered water quality and consequent reduction in the beneficial uses that the Nation's waters will support. SSOs reduce the opportunity to use waters for fishing, swimming, shellfish gathering, aesthetic enjoyment and other purposes. Calculations based on State water quality assessments developed under Section 305(b) of the Clean Water Act indicate that SSOs impair as much as 1 - 2 % of all waters nationwide, and a higher percentage of the waters in urban areas where much of the population lives. This diminution of water quality causes a variety of quantified economic losses (e.g., beach closures) and other unquantifiable adverse impacts (e.g., degraded aquatic communities, unsightly conditions, odors).

- Property damage and clean-up costs. SSOs that back-up into basements damage walls and floors, furniture, rugs, and stored items, as well as causing potential health risks, loss of use, and general frustration for home and business owners. Most SSOs, whether they occur in basements or in the general environment must also be cleaned up, at costs that may range from several hundred to many thousand dollars per incident.

EPA's analysis of the benefits of abating SSOs estimates the amount of quantifiable, monetizable damages resulting from SSOs to be $1.0 billion to $5.5 billion annually. The great majority of SSOs that occur are unauthorized under current regulations. Many occur when inadequate system capacity is

exceeded during wet weather conditions, or when excessive infiltration and inflow overwhelm what would otherwise be adequate capacity. Many others occur during dry weather because of blockages or pipe failures that could have been avoided by good preventive maintenance programs. In short, the bulk of the substantial damages resulting from SSOs are avoidable through provision of adequate collection system capacity and proper operation and maintenance.

These damages from SSOs represent a classic example of an environmental externality. Actions taken by a community in managing its collection system have the potential to impose large costs on downstream water users and others outside of the community, and these potential "external" costs are unlikely to be adequately considered in the community's decision. Regulatory intervention is appropriate in this instance to ensure that the collection system is managed in a manner that strikes a balance between the interests of the community and the interests of the affected outsiders.

3.2 The Need to Protect and Enhance Investments in Sewer System Infrastructure

Sanitary sewer collection systems represent a major national investment in community infrastructure. About 150 million people are served by municipal sanitary sewer collection systems, which include an estimated 500,000 miles of municipally owned pipes, a roughly equal quantity of privately owned pipes that deliver wastewater into these systems, and innumerable pump stations, manholes, control devices and other items. In total, EPA estimates that these systems have a replacement value of $1 - $2 trillion. Another source estimates that wastewater collection and treatment systems represent about 10 - 15 % of the value of all publicly owned infrastructure in the U.S. In most communities, these systems have been built with funds from all three levels of government -- local, State and Federal. This infrastructure thus represents an investment contributed to by all Americans.

Much of this sanitary sewer infrastructure can be considered old, with some sewers having been constructed more than a century ago. All of the infrastructure, whether new or old, is continually deteriorating, due to stresses from temperature changes, land subsidence, invasive tree roots, corrosion, construction disturbances, increasing flows, and natural aging of materials. Large sums (currently some $1.6 billion annually[2]) are spent to operate and maintain this infrastructure, to extend its life, and hopefully to keep it in a condition so that it will continue to provide its intended service.

Unfortunately, however, the substantial frequency of SSOs and other collection system failures indicates that operation, maintenance, repair and rehabilitation of sewer systems needs to improve. In response there has been some hopeful evidence that both: 1) Increasing sums are being spent on these

[2] Parsons Engineering Science, Sanitary Sewer Overflow (SSO) Needs Report. Draft, May, 2000. Section 4.6 and Appendix H.

activities to protect the Nation's investment in sanitary sewer systems; and 2) These reinvestment activities are being conducted in a more cost-effective, "smarter" manner. The second of these developments is of particular interest, offering the possibility of doing "more for less" and mitigating the need for increasing spending.

A growing number of communities have been implementing sophisticated procedures to manage their collection systems as a capital asset over a long time horizon. A wide variety of specific measures may be included: carefully designed preventive maintenance programs; diagnostic procedures to pinpoint potential trouble spots for repair before they fail; life-cycle cost analysis procedures to assist in optimizing the timing of expenditures; greatly expanded use of computers and information management systems; enhanced procedures for soliciting and responding to public concerns about system performance; efforts to develop and document industry "best practices" and to facilitate benchmarking of a system's performance against that of its peers; capital budgeting approaches to system maintenance and rehabilitation that assure stable, long-term funding for these purposes; and more. These sorts of measures contribute to collection system management that is more efficient, effective, anticipatory, responsive and continually improving.

EPA believes that there is not a need to prescribe by regulation the adoption of any of these specific procedures for capital asset management. A community will ultimately make a reasonable decision for itself, depending on its specific circumstances, about whether adopting these or other procedures is appropriate. EPA does believe, however, that there is a need to require communities by regulation to develop certain prerequisites that must be in place before the communities can sensibly determine how to manage their sanitary sewer collection systems. These prerequisites include:

- Information about the performance of the collection system;
- A planning process to address how to ensure adequate capacity and operation and maintenance of the collection system;
- Performance measures and goals for the system;
- Adequate legal authorities to enable a set of desirable collection system activities; and
- Reporting of key performance information to the public and to oversight authorities.

In general, these activities provide the informational infrastructure that is necessary before informed decisions can be made by all parties (system managers, the public and oversight authorities) about how the physical infrastructure should be managed. The lack of this information for many systems is another variety of market failure that prompts the proposed regulations. The proposed regulations will ensure that the

necessary information and authorities are available for all sanitary sewer collection systems to support capital asset management decision-making.

3.3 The Need to Provide a Clear and Consistent Regulatory Program for Collection Systems

States are implementing the existing NPDES regulations relevant to sanitary sewer collection systems in widely differing ways. A survey conducted in 1996 by the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) that collected information from States on their municipal sanitary sewer collection systems and related policies and practices documents the varying interpretations of how the national regulations apply to SSOs. In light of the considerable variation among States in their regulatory approaches, ASIWPCA noted that clarifying national SSO policy expectations and increasing awareness of them among collection system operators, with special attention to satellite systems, is one of the areas that could most benefit from national attention.[3] Several examples drawn from the ASIWPCA report demonstrate the inconsistent application of the NPDES regulations:

- Regulation of collection systems and approach for addressing discharges from collection systems. Of the 34 States responding to the survey, 28 establish requirements pertaining to collection systems in discharge permits for treatment facilities, while 6 do not. Of these 28 States, 24 address discharges from the collection system by applying the bypass or similar provisions and 20 do so by applying the upset or similar provisions.

- Approach to satellite collection systems. Two States issue permits for all such systems, 5 States issue permits for some of these systems, and 26 States do not issue permits for these systems. In States not issuing discharge permits for all such systems, satellite collection systems may be regulated by local entities (10 States), other State measures (17 States), or other means (4 States). In 2 States, satellite collection systems are not regulated at all.

- Reporting SSOs. States believe that compliance with NPDES reporting requirements for SSOs is mixed, with poor reporting in some categories. Only 30 percent of the States responding to the ASIWPCA survey estimate that all or nearly all of their municipal permittees comply with SSO reporting requirements, with a corresponding figure of 22 percent of States for their private sector permittees. Further, 18 percent of States thought that less than 50 percent of their municipal permittees are in compliance with SSO reporting requirements, with a corresponding figure of 31 percent of States for their private sector permittees.

[3] ASIWPCA, 1996. Sanitary Sewer Overflows (SSOs). ASIWPCA Membership Survey Results.

There has been some uncertainty among State NPDES authorities and permittees regarding the specific meaning of current NPDES regulations relevant to collection systems and SSOs. The SSO Federal Advisory Subcommittee, which included representatives from States, municipal wastewater utility associations, individual sewerage agencies, the National League of Cities, the Association of Counties, the Water Environment Federation and consulting firms, voiced concerns about the lack of specificity and clarity in current regulations. Some key uncertainties raised by the SSO Subcommittee regarding existing requirements include the practices that are necessary for a system to meet the current requirement for "proper operation and maintenance"; whether and how enforcement discretion fits into the regulatory framework; the definitions of bypass and upset; SSO reporting requirements; and the applicability of NPDES requirements to satellite collection systems.[4] The lack of uniform definitions and interpretations regarding SSOs and collection systems has been cited by municipalities as one reason why accurate characterization of their collection systems is so difficult.[5]

Uncertainty among State NPDES authorities and permittees regarding the correct interpretation of regulatory requirements applicable to collection systems has contributed to the wide variation in State approaches seen today, and to further variation in the degree to which permittees comply with these differing State requirements. This uncertainty, in conjunction with the persistent underfunding of collection system infrastructure, has resulted in current practice that often falls short of the requirements of the CWA and existing Federal NPDES regulations.

EPA's proposed regulations both clarify the existing the existing NPDES requirements applicable to sanitary sewer collection systems and SSOs, and add the further provisions necessary to create a comprehensive program. All of the existing and proposed new provisions relating to collection systems and SSOs will be pulled together in one place into a set of three standard conditions that must be included in all NPDES permits for POTWs and municipal sanitary sewer collection systems. The three proposed standard permit conditions would address:

- Reporting, public notification and record keeping requirements for discharges from a municipal sanitary sewer collection system;

- Capacity, management, operational, and maintenance requirements for municipal sanitary sewer collection systems; and

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[4] SSO Subcommittee Meeting Summaries for August 9, 1995; Oct. 12-13, 1995; January 25, 1996; September 9-10, 1996.

[5] Peterson et al., 1984. *Guides to managing urban capital Volume 3: Guide to benchmarks of urban capital condition*. Washington, DC: The Urban Institute Press.

- A prohibition on discharges from a municipal sanitary sewer collection systems to waters of the United States that are not authorized by an NPDES permit.

In drafting these regulations creating a clearer program for sanitary sewer collection systems, EPA also seeks to meet the objectives of President Clinton's June 1, 1998 Memorandum on plain language in government writing. The Memorandum calls on Executive Departments and Agencies to use plain language in all proposed and final rulemaking documents, and to consider rewriting existing regulations in plain language when resources permit. The Memorandum notes that by using clear language, the Federal Government sends "a clear message about what the Government is doing, what it requires, and what services it offers." By clarifying the existing NPDES regulations and consolidating them with new provisions into a coherent program, EPA's rulemaking is intended to be consistent with the goals of the Presidential Memorandum.

4. BASELINE FROM WHICH THE COSTS AND BENEFITS OF THE PROPOSED RULE ARE MEASURED

The proposed rule has two primary objectives. First, the rule reiterates, reorganizes and clarifies existing regulatory requirements for sanitary sewer collection systems in order to provide the regulated community with an understandable and unified package of requirements. Clearer requirements will contribute to consistent interpretation and better performance. Second, the proposed rule adds new requirements that will complete a comprehensive regulatory program for collection systems. The entire program will: 1) Enhance the certainty and efficiency with which collection systems achieve the Clean Water Act standard of no unauthorized discharge; and 2) Elicit the information, planning, analysis and legal authorities that will facilitate prudent management of collection systems as an invaluable capital asset.

Before the incremental costs associated with the new requirements in the proposed rule can be addressed, it is first necessary to establish the baseline against which the incremental costs and benefits of the rule are measured. This Section discusses the baseline that has been adopted for this Economic Analysis. Subsection 4.1 defines the baseline as full compliance with existing CWA and NPDES requirements. This subsection also describes EPA's approach in determining whether or not a proposed provision imposes new requirements beyond this baseline. Subsection 4.2 provides an overview table that classifies each provision in the proposed rule as "clarifying" -- adding nothing to existing regulations and hence imposing no requirements incremental to the baseline -- or as "new" and thus potentially imposing incremental costs. This subsection also references each proposed provision that is classified as "clarifying" to the existing NPDES requirements that the provision derives from. Finally, Subsection 4.3 provides information on the extent to which current actual performance by sanitary sewer collection systems falls short of meeting existing CWA and NPDES requirements. Given the baseline definition adopted for this Economic Analysis, any spending needed to upgrade collection system performance from current levels to full compliance with existing requirements is <u>not</u> a cost of this rule. Nevertheless, this subsection provides as context for the reader a summary of the findings of the separate "Needs Report" that estimates the costs for collection systems to improve their performance from current levels to full compliance with existing requirements.

4.1 The Baseline is Compliance with Existing CWA and NPDES Requirements

The impact of the proposed rule will be estimated relative to a baseline in which regulated entities are assumed to comply with all existing Federal requirements. The costs and benefits of the proposed rule will thus consist of the incremental impacts resulting from moving from a baseline in which compliance is assumed with existing requirements to a new "state-of-the-world" in which compliance is assumed with the requirements set forth in the proposed rule. More specifically, the impacts from requirements in the proposed rule pertaining to record keeping, reporting, public notification, CMOM, the prohibition on

discharges, and satellite collection systems will all be measured incremental to assumed compliance with the provisions addressing these topics in existing NPDES regulations.

The baseline has been defined as compliance with all existing Federal requirements in order to focus on and isolate the incremental impacts resulting specifically from the proposed rule. As noted previously, EPA has prepared separate analysis that estimates the costs associated with improving collection system performance from current levels to full compliance with existing statutory and regulatory requirements. The costs estimated in the Needs Report are separate and distinct from the costs associated with the proposed rule.

In addition to considering the baseline of existing requirements, the cost analysis for the proposed rule also considers whether, and to what extent, municipalities already now perform activities set forth in the proposed rule even though they are not currently explicitly required by Federal regulations. There are a variety of reasons why some or all communities might currently be performing an action even though it has not yet been required by Federal regulations -- perhaps some forward-looking communities have foreseen that the action will be advantageous in properly operating their systems; perhaps some States already established permit conditions which require that the action be performed. Field data, collection system benchmarking studies, surveys of practice, and other industry sources have been consulted in order to determine the extent to which communities may already be meeting some of the new requirements in the proposed regulation.

These sources indicate generally that large communities are more likely already to be performing activities exceeding current Federal requirements than are small communities. For example, consider the proposed requirements that communities enact legal authorities to control infiltration and inflow and to address flows from satellite municipal collection systems. An estimated 75 percent of communities of 250,000 people or more already have such legal authorities, in contrast with only about 10 percent of communities under 10,000 that now have such authorities.[6] There are exceptions to this pattern, however. One new requirement in the proposed rule is that a permittee must develop and implement an Overflow Response Plan describing the community's procedures to stop and mitigate any overflows that occur and to notify potentially exposed persons. An estimated 38% of municipalities in all size categories are believed now to have an adequate Overflow Response Plan in place.[7]

In instances where a community is already performing an activity that would be newly required by the proposed rules, the community will not incur any incremental costs in order to comply with the new

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[6] Field Data, Northern Virginia Planning District Commission

[7] Survey data from Arbour and Kerri (1998) indicating the percentage of respondents documenting the existence of established written procedures for containing and evaluating overflows.

requirement. Similarly, if some portion of all communities now already perform the activity, incremental compliance costs will be limited to the remainder of communities that do not already perform the activity. In order to account for current practices by communities that go beyond the baseline of existing Federal requirements, the cost analysis in Section 5 of this document measures the incremental costs of the proposed rule relative to the higher of:

1. Existing Federal regulatory requirements; or

2. Current practice by the regulated community.

For each provision imposing a new requirement, Section 5.3 provides a summary of the specific factors considered in estimating costs. Where applicable, the summary includes data on the percentage of communities in different size categories that already meet the proposed requirement, and that therefore will not incur any incremental costs as a result of the provision.

4.1.1 Rationale for categorizing provisions as new or as clarifying

The proposed regulation includes many provisions, only some of which will impose new, incremental requirements beyond the baseline of existing requirements. As a first step in estimating the impacts of the proposed rule, EPA determined whether each provision did or did not impose new requirements beyond those in the baseline of existing regulations. Each proposed provision was assigned to one of two categories:

4) "Clarifying" provisions: Provisions that only clarify existing regulatory requirements, that do not add any new substantive requirements, and that therefore do not add any new costs or provide any additional benefits.

5) "New" provisions: Provisions that add new requirements, requiring something that is not already required under existing regulations.

The extent to which incremental costs and benefits are attributed to the proposed rule hinges on whether the rule's various provisions create new requirements beyond the baseline. In general, a provision is categorized as "new" if it would change existing rights or obligations, or would penalize actions or inactions that are currently not penalized. A proposed provision is categorized as a "clarifying" provision if it clarifies the meaning of broad language found in existing regulations by describing specific processes or procedures that are implied by and encompassed within the broad language. Provisions are also categorized as "clarifying" if they simply reiterate or reorganize existing requirements for the purpose of providing a more cohesive, better organized, more easily understandable package of SSO program requirements.

For example, the proposed CMOM requirements addressing overflow response plans would require a permittee to "develop and implement an overflow response plan that identifies measures to protect public health and the environment." This proposed requirement is new because the permittee has no obligation to develop such a plan under the existing regulations. Under the proposed regulations, though, a permittee that did not develop and implement an overflow response plan would not be in compliance with his permit and would be subject to enforcement action.

A different example is provided by the proposed requirement that a permittee must develop a CMOM program that addresses maintenance of facilities and routine preventive operation and maintenance activities. These two prescribed portions of a CMOM program do not represent new requirements. These requirements are already implied in existing section 122.41(e) of the NPDES regulations, which requires a permittee to "properly operate and maintain" the collection system. These provisions in the proposed regulation impose no incremental duties beyond what is inherent in existing regulations, and they therefore entail no incremental costs or benefits.

4.2 Identification and Overview of Clarifying Provisions in the Proposed Rule

The summary table below applies the definitions of "new" and "clarifying" to each of the provisions in the proposed rule. The table lists all the provisions of the proposed rule and identifies whether each provision imposes new requirement(s) or only reiterates, reorganizes, or clarifies an existing requirement. For each provision identified as a "clarifying" provision, the table provides a justification explaining how the provision clarifies an existing requirement and a citation to the existing requirement that is being clarified. Proposed provisions that add new, incremental requirements and that are therefore identified in the table as "new" are addressed in Section 5, which estimates the incremental costs for each of the "new" provisions in the proposed rule.

Most of the clarifying provisions are included in the proposed rule in order to reiterate and clarify -- in accordance with the directives on plain English in regulations -- existing regulatory requirements to minimize and prevent discharges including SSOs (known as "the duty to mitigate") and to properly operate and maintain the collection system. Under these requirements, permittees must:

> "... take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of [the NPDES] permit which has a reasonable likelihood of adversely affecting human health and the environment." [40 CFR 122.41 (d)]; and
>
> "... at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with [the NPDES] permit... " [40 CFR 122.41(e)].

These two requirements play a critical role in ensuring that the Clean Water Act prohibition on unauthorized discharges is met. The proposed rule reiterates these requirements, clarifies their scope and applicability particularly to sanitary sewer collection systems, and makes explicit the tasks and duties implied by these requirements. For example, the proposed rule sets forth general performance standards for permit holders that are applicable to collection systems. These standards would require that permittees

1) Properly manage, operate and maintain, at all times, all parts of the collection system that they own or over which they have operational control;

2) Provide adequate capacity to convey base flows and peak flows for all parts of the collection system they own or over which they have operational control; and

3) Take all feasible steps to stop, and mitigate the impact of, sanitary sewer overflows in portions of the collection system they own or over which they have operational control.

Each of these proposed standards reiterates and/or clarifies one or both of the existing "duty to mitigate" and "proper O&M" requirements. The first proposed general performance standard clarifies that the existing requirement to properly operate and maintain "all facilities and systems of treatment and control (and related appurtenances)" includes all parts of the collection system that the permittee owns or over which he has operational control. The second proposed performance standard, which addresses capacity, makes explicit EPA's understanding that the provision of adequate capacity to convey base and peak flows is a "reasonable" and fundamental step to "minimize or prevent any discharge", and that provision of adequate capacity is part of what constitutes "proper operation." The third proposed standard simply clarifies that "reasonable steps to minimize or prevent any discharge [including SSOs] ... that has a reasonable likelihood of adversely affecting human health and the environment..." should be understood to include "all feasible steps to stop, and mitigate the impact of, SSOs". As is the case for all provisions considered to be "clarifying", these performance standard provisions do not add any new, incremental requirements, and therefore do not impose any new costs. Most of the clarifying provisions in the proposed rule similarly serve only to reiterate, reorganize and clarify the existing requirements on proper O&M and SSO prevention and minimization.

Some "clarifying" provisions in the proposed rule serve to clarify existing regulatory requirements other than "proper O&M" and "duty to mitigate". For example, under the proposed rule permittees are required to include legal authority through sewer use ordinances, service agreements, or other legally binding documents to implement the general and specific prohibitions of the national pretreatment program. This provision is simply a restatement of existing requirements under the construction grant regulations that POTW and collection system permittees must implement the pretreatment program (40 CFR 403.5). Another group of provisions in the proposed rule addressing 1) the general prohibition on municipal sanitary

sewer discharges, 2) discharges caused by severe natural conditions, and 3) discharges caused by other factors, serve to reorganize and reiterate the existing Clean Water Act prohibition on unauthorized discharges and related regulatory requirements at 40 CFR 122.42(n).

As noted above, the summary table provides for each clarifying provision a brief explanation of how the provision clarifies a particular existing requirement. A more detailed explanation of the ways in which clarifying provisions in the proposed rule reiterate, reorganize and clarify existing requirements is presented in Appendix A. The appendix compares each of the clarifying provisions with existing Federal requirements and demonstrates that they impose no new duties.

Table 4-1: New and clarifying provisions in the proposed rule and justification for clarifications

PROVISION	*NEW OR CLARIFICATION?*	*CLARIFICATION JUSTIFICATION*
RECORD KEEPING AND REPORTING		
Record Keeping		
Maintain detailed records of SSOs which occurred during the previous 3 years	Clarification	CFR 122.41(j)(2) requires retaining for 3 years copies of all reports required by the permit, and 122.41(l)(6) requires reporting of any noncompliance event which may endanger public health or the environment, including location, volume, component, date/time, cause, and steps taken to prevent reoccurrence
Maintain a 3 year record of work orders associated with SSOs	New	
Maintain a 3 year record of customer/other complaints	New	
Maintain a 3 year record of performance and implementation documentation	New	
24-Hour and Follow-Up Reports		

PROVISION	***NEW OR CLARIFICATION?***	***CLARIFICATION JUSTIFICATION***
Provide to the NPDES authority either an oral or electronic report within 24 hours of becoming aware of the overflow	Clarification	Existing CFR 122.41(l)(6) requires oral reporting within 24 hours of any noncompliance event which may endanger public health or the environment
Provide to the NPDES authority a detailed written report within 5 days of becoming aware of the overflow	Clarification	Existing CFR 122.41(l)(6) requires a written report within 5 days of any noncompliance event which may endanger public health or the environment
Director may waive written report requirement on a case-by-case basis	Clarification	Existing CFR 122.41(l)(6)(iii) authorizes the Director to waive reporting requirements on a case-by-case basis
Discharge Monitoring Reports - for discharges to waters of the United States that occurred during the reporting period	Clarification	Existing CFR 122.41(l)(7) includes all reporting of noncompliance not reported under 122.41(l)(4), (5), and (6)
Annual Report - of all overflows in the sewer system, to be made available to the public.	New	
PUBLIC NOTICE OF MUNICIPAL SEWER SYSTEM OVERFLOWS		
Immediately notify the public, health agencies, drinking water suppliers and other affected entities of overflows that may imminently and substantially endanger human health	New	
CAPACITY, MANAGEMENT, OPERATION AND MAINTENANCE PROGRAMS FOR MUNICIPAL SANITARY SEWER SYSTEMS		
General Standards		
Properly manage, operate and maintain, at all times, all parts of collection system	Clarification	Existing CFR 122.41(d) & (e); adds specific reference to 'collection system'

PROVISION	***NEW OR CLARIFICATION?***	***CLARIFICATION JUSTIFICATION***
Provide adequate capacity to convey base flows and peak flows	Clarification	Existing CFR 122.41(d) and (e): proper operation, duty to *prevent* unauthorized discharge
Take all feasible steps to stop, and mitigate the impact of, sanitary sewer overflows	Clarification	Existing CFR 122.41(d) "...reasonable likelihood of affecting human health or the environment..."
Provide notification to parties with a reasonable potential for exposure to pollutants associated with the overflow event	New	
Develop a written summary of the CMOM program and make it available to the public upon request	New	
Management Program - develop an appropriate and applicable CMOM program. The program must:	--	
Goals - Identify with specificity the major goals of the CMOM program	New	
Organization - Identify: (A) administrative and maintenance positions responsible for implementing measures in your CMOM program; and (B) the chain of communication for reporting SSOs under proposed reporting requirements	New	
Legal Authority - Include legal authority through sewer use ordinances service agreements, or other legally binding documents to:	--	
(A) control infiltration and connections from inflow sources;	New	
(B) require that sewers and connections be properly designed and constructed;	New	

PROVISION	***NEW OR CLARIFICATION?***	***CLARIFICATION JUSTIFICATION***
(C) ensure proper installation, testing, and inspection of new and rehabilitated sewers;	New	
(D) address flows from satellite municipal collection systems; and	New	
(E) implement the general and specific prohibitions of the national pretreatment program that the permittee is subject to under existing regulations (40 CFR 403.5)	Clarification	Existing pretreatment program requirements at 40 CFR 403.5
Measures and Activities - A permittee's CMOM program must address the elements listed below that are appropriate and applicable to the permittee's system and identify the person or position in the permittee's organization responsible for each element:		
(A) maintenance of facilities;	Clarification	Clarification of existing CFR 122.41 (e): proper operation and maintenance
(B) maintenance of a map of the collection system;	New	
(C) management of information and use of timely, relevant information to establish and prioritize appropriate CMOM activities, and identify and illustrate trends in overflows;	New	
(D) routine preventive operation and maintenance activities;	Clarification	Existing requirements for preventive operation and maintenance in existing CFR 122.41(d) [emphasis on *prevent*] and (e)
(E) assessment of the current capacity of the collection system and treatment facilities;	New	

PROVISION	***NEW OR CLARIFICATION?***	***CLARIFICATION JUSTIFICATION***
(F) identification and prioritization of structural deficiencies and identifying and implementing short-term and long term rehabilitation actions to address each deficiency;	New	
(G) appropriate CMOM Program training on a regular basis;	New	
(H) equipment and replacement parts inventories including identification of critical replacement parts.	Clarification	Existing 122.41 (e) for proper operation, "...requires the operation of backup ...facilities" which implies maintaining an inventory of critical replacement parts
Design and Performance Provisions - The permittee must establish:	--	
(A) requirements and standards for the installation of new sewers, pumps and other appurtenances; and rehabilitation and repair projects	New	
(B) procedures and specifications for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects	New	
Monitoring, Measurement and Program Modifications - The permittee must monitor the implementation and, where appropriate, measure the effectiveness of each element of the CMOM program. The permittee must update program elements as appropriate based on monitoring or performance evaluations. The permittee must modify the summary of the CMOM program as appropriate to keep it updated and accurate.	New	

PROVISION	***NEW OR CLARIFICATION?***	***CLARIFICATION JUSTIFICATION***
Overflow Response Plan - The permittee must develop and implement an overflow response plan that identifies measures to protect public health and the environment, including but not limited to, mechanisms to:	New	
Ensure that the permittee is made aware of all overflows (to the greatest extent possible)	Clarification	122.41 (d) Duty to mitigate, and common law "duty to know"
Ensure that overflows are appropriately responded to, including ensuring that reports of overflows are immediately dispatched to appropriate personnel for investigation and appropriate response	Clarification	122.41 (d) Duty to mitigate requires the permittee to take all reasonable steps to minimize or prevent any discharge... which has a reasonable likelihood of adversely affecting human health or the environment, which implies responding to overflows.
Ensure appropriate reporting pursuant to proposed reporting requirements	Clarification	Reporting requirements under existing 40 CFR 122.41(l)(6)
Ensure appropriate notification to the public, health agencies, and other impacted entities (e.g. water suppliers) pursuant to proposed notification requirements	New	
Ensure that appropriate personnel are aware of and follow the Overflow Response Plan, and are appropriately trained; and ...	New	
Provide emergency operations.	Clarification	122.41 (d), Duty to mitigate implies providing for emergency response

PROVISION	*NEW OR CLARIFICATION?*	*CLARIFICATION JUSTIFICATION*
System Evaluation and Capacity Assurance Plan - The permittee must prepare and implement a plan for system evaluation and capacity assurance if peak flow conditions are contributing to an SSO discharge unless the permittee has either (1) already taken steps to correct the hydraulic deficiency or (2) the discharge was caused by severe natural conditions, as defined in the proposed general prohibition provisions. At a minimum the plan must include:	New	
Evaluation - Steps to evaluate those portions of the collection system which are experiencing or contributing to an SSO discharge caused by hydraulic deficiency or to noncompliance at a treatment plant. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, provide estimates of the capacity of key system components, identify hydraulic deficiencies, including components of the system with limiting capacity and identify the major sources that contribute to the peak flows associated with overflow events.	Clarification	Clarification of terms in 122.41 (e) for proper operation
Capacity Enhancement Measures - Establish short and long term actions to address each hydraulic deficiency including prioritization, alternative analysis, and a schedule.	New	

PROVISION	*NEW OR CLARIFICATION?*	*CLARIFICATION JUSTIFICATION*
Plan updates - The System Evaluation and Capacity Assurance Plan must be updated to describe any significant change in proposed actions and/or implementation schedule. The plan must also be updated to address available information on the performance of measures that have been implemented.	New	
CMOM Program Audits - As part of the NPDES permit application, the permittee must conduct an audit, appropriate to the size of the system and the number of overflows, and submit a report of such audit, evaluating the CMOM and its compliance with this subsection, including its deficiencies and steps to respond to them.	New	
Communications - The permittee should communicate on a regular basis with various interested parties on the implementation and performance of its CMOM program. The communication system should allow interested parties to provide input to the permittee as the CMOM program is developed and implemented.	New	
PROHIBITION ON MUNICIPAL SANITARY SEWER SYSTEM DISCHARGES		
General Prohibition - Municipal sanitary sewer system discharges that occur prior to a POTW treatment facility are prohibited. Neither the bypass or the upset provisions in existing regulations (40 CFR 122.41(m)) and (n)) apply to these discharges.	Clarification	Clarification that CWA prohibition on unauthorized discharges applies to collection system

PROVISION	***NEW OR CLARIFICATION?***	***CLARIFICATION JUSTIFICATION***
Discharges Caused by Severe Natural Conditions - See full description in Appendix A	Clarification	Clarification and reorganization of upset provisions in existing 122.41(n)
Discharges Caused by Other Factors - See full description in Appendix A	Clarification	Clarification and reorganization of upset provisions in existing 122.41(n)(1) and (3)(ii)
Burden of Proof - In any enforcement proceeding, the permittee has the burden of proof to establish that the criteria in this section have been met.	Clarification	Clarification of upset provisions in existing 122.41(n)(4)
MUNICIPAL SATELLITE SEWER COLLECTION SYSTEMS		
Permit Requirement - Municipal satellite sewer collection systems are point sources subject to the NPDES program	New	
Definitions - Municipal satellite sewer collection systems means any device or system that meets each of the following criteria: (1) is owned by a State or municipality, (2) is used to convey municipal sewage or industrial waste to a treatment facility that has or has applied for a NPDES permit, and (3) the operator is not the owner or operator of the treatment facility that has or has applied for a NPDES permit.	New	

PROVISION	*NEW OR CLARIFICATION?*	*CLARIFICATION JUSTIFICATION*
Duty to Apply - Municipal satellite collection systems without a permit must submit a complete permit application. This does not include municipal satellite collection systems covered by a general permit under existing regulations applying to combined satellite sewer systems (40 CFR 122.28). Application requirements are described in proposed 122.38(d).	New	

4.3 A Separate "Needs Report" Estimates the Nationwide Costs for Collection Systems to Meet Existing CWA Requirements

Current collection system performance regarding SSOs varies considerably. Despite the CWA prohibition on unauthorized point source discharges into the waters of the United States, many collection systems experience unauthorized and excessive SSOs. One of the most important causes of these SSOs is the aging of collection system infrastructure and the lack of adequate reinvestment to maintain infrastructure integrity.

Many of our nation's sewer systems date back over 100 years to the 19th century, when brick sewers were common[8]. A survey by the American Society of Civil Engineers (ASCE) of 42 wastewater utilities found that collection system age ranged from new to 117 years, with an average of 33 years.[9] The performance of older sewer systems is affected both by age-related failures and by problems relating to the original material of sewer and manhole construction. For example, older vitrified clay pipe was manufactured in short lengths with a relatively high number of field-applied joints that have the potential for leakage. Clay pipes also are more susceptible to hydrogen sulfide corrosion than such newer materials as PVC and HDPE. As a result, many collection systems are beset by pipe failures and high levels of infiltration and inflow, and consequently experience SSOs.

Significant reinvestment in these systems is required just to maintain current performance levels, and more is needed to improve performance and serve a growing population. Yet needs for investment and

[8] EPA, Sewer System Infrastructure Analysis and Rehabilitation, 1991.

[9] ASCE, 1998. *Optimization of Collection System Maintenance Frequencies and System Performance* Draft June 1998. EPA Cooperative Agreement #CX 824902-01-0

reinvestment in collection systems have increasingly gone unmet. Historically, the "out-of-sight, out-of-mind" nature of the wastewater collection system has tended to place reinvestment in these systems low on the priority list for public funding. Moreover, the benefits of new investments and reinvestment today often do not become evident for years, making it difficult for elected officials to dedicate limited available funds to the sewer system. Funding often comes only when emergencies occur, or when deterioration has become so pronounced that large investments can no longer be avoided. As a result, investment and reinvestment needs accumulate, as well as the number of SSOs that occur.

Despite this accumulation of sanitary sewer system reinvestment needs, a recent survey by the Rebuild America Coalition showed that 74% of Americans are very or somewhat willing to spend 1% more per year in taxes if it means that they could guarantee a safe and efficient sewage and water treatment system. This result is particularly impressive when compared to survey results for other categories of infrastructure investments (e.g. creating safe, modern and healthy schools (66% were very or somewhat willing to spend 1% more per year in taxes); eliminating local road congestion (62%); improving public transit service levels (56%); tearing down and replacing every coal-fired, pre-WWII public school (49%); and having airports that allow you to take off and land on time wherever you fly (40%)).[10] The survey results suggest that the impacts of postponed and inadequate reinvestment in sanitary sewer systems have become evident to the public, and that willingness to address these impacts through reinvestment is substantial.

A partial estimate of the capital investment needed for collection systems is provided by EPA's 1996 Clean Water Needs report. This study estimated that needs for reduction of inflow and rain-induced infiltration (RDII) and for sewer rehabilitation -- most of which is directly related to reducing SSOs -- totaled $10.3 billion. Additional portions of other categories of the needs documented in this report (e.g., Category 1 needs for wastewater treatment facilities and Category 4 needs for new sewers) also derive from problems involving SSOs.

EPA has developed an SSO "Needs Report" to estimate more precisely the nation's needs specifically relating to SSOs. The study estimates the cost of upgrading collection systems from their current actual performance to complete compliance with existing SSO requirements. The results indicate that the costs of the capital investments and enhanced operations and maintenance (O&M) needed to attain compliance are substantial.

The SSO Needs Report includes a model that simulates the performance of all collection systems in the country. The model can estimate the costs of improving collection system performance from current levels to different target frequencies for SSOs. To generate this estimate, the model first simulates the

[10] Rebuild America Infrastructure Survey, prepared by The Luntz Research Companies, January 1999. Http://www.rebuildamerica.org/reports/survey.html

number of SSOs in each of the nearly 20,000 municipally-owned sanitary sewer collection systems that are listed in the Clean Water Needs database. SSO estimates are generated using data on historical storm records and currently existing flows and treatment and storage capacity for the systems. A cost-minimization routine is then run to determine the least-cost combination of additional storage, additional wet weather treatment capacity, and reduced inflow and rain-induced infiltration that would be required for each system to meet different target SSO frequencies. These costs are then summed across all the collection systems modeled to arrive at a national cost estimate.

The model projects that the annualized costs for all collection systems to improve from today's performance levels to virtual elimination of wet weather SSOs -- essentially the costs of achieving compliance with existing requirements -- will be roughly $ 5.4 - 8.3 billion annually.

The report further estimates that approximately $1.5 billion annually is needed in additional spending for enhanced collection system operations and maintenance activities in order to eliminate all reasonably avoidable dry weather SSOs.

Again, although these costs are considerable, they do not represent new costs associated with the proposed regulation. These costs are associated with longstanding reinvestment needs which have not yet been addressed. Because these investments have not been made, many collection systems are experiencing unacceptably high numbers of SSOs that threaten human health and the environment. The needs and corresponding costs estimated in the "Needs Report" estimate the infrastructure cost of complying with the SSO program, and are distinct from the costs of complying with the proposed regulation.

5. COSTS OF THE PROPOSED RULE

The proposed rule adds a set of new requirements that will help protect public investment in sanitary sewer systems and enhance the certainty and efficiency with which collection systems achieve the Clean Water Act standard of no unauthorized discharge. The proposed rule's new reporting and public notification requirements will improve the ability of NPDES authorities and the public to evaluate the performance of collection systems and to respond to SSOs. Other new requirements in the proposed rule address capacity, management, operation and maintenance (CMOM) programs. The proposed new CMOM requirements will provide a framework for municipalities to: 1) evaluate and modify their approach to collection system management, operation and maintenance; and 2) ensure that their collection systems have adequate capacity.

A proposed requirement is categorized as 'new' if it would change existing rights or obligations or would penalize actions or inactions that are currently not penalized. A new Federal requirement will impose incremental costs on collection systems, unless the regulated community is already performing the desired activity as a matter of industry practice or unless the activity is already required by States. In addition, a new Federal requirement may entail incremental costs for State NPDES authorities (or EPA, if it acts as a State's NPDES authority) as they review and respond to the documentation prepared by collection systems pursuant to the proposed requirement.

For each of the provisions in the proposed regulation that adds new requirements, incremental costs have been estimated. Subsection 5.1 describes the common cost-estimating procedures that have been used in analyzing all the new provisions. Subsection 5.2 provides overview information on each new requirement: a summary of the substance of the requirement, the incremental cost that has been estimated for the requirement, and a description of the key steps in estimating this cost. Full detail on how the cost of each provision has been estimated -- data and sources, assumptions, and methods -- is provided in an Appendix. Subsection 5.3 summarizes the total costs of the proposed rule, shows how these costs vary with community size, and projects their magnitude on a per household basis. Subsection 5.4 considers the impact of these incremental costs by comparing them with current household spending for wastewater services.

5.1 General Cost Estimating Procedure

This subsection describes the general approach by which the incremental costs associated with the new requirements in the proposed rule are estimated. This subsection addresses the over-arching methods and assumptions that are used in estimating costs for all provisions. Cost estimating methodologies that are specific to particular provisions are addressed in subsection 5.2 and 5.3 on a provision-by-provision basis.

5.1.1 Unit costs for activities, scaling by system size, and aggregating across systems

Specific tasks were identified for each new regulatory requirement that regulated entities or oversight authorities would need to accomplish in order to comply with the requirement. Estimates were developed for the unit costs of each task (e.g., labor hours, equipment and material requirements needed to perform the task one time) and how often the task would need to be accomplished by the entity. In most cases, either the unit cost and/or the frequency with which the task must be performed was assumed to increase with increasing size of the collection system. Typically unit costs and frequency were scaled based on the population served by the collection system. Thus, for example, in most instances it was assumed that developing a plan would require more labor hours for a system serving 10,000 to 25,000 people than for a system serving less than 10,000 people. For some provisions, such as flow monitoring in problem areas, unit costs were scaled based on the number of miles of sewers in the system rather than the population served (these two scaling factors are effectively identical, as sewer miles were estimated by combining service population figures from the Clean Water Needs Survey Database with an assumption of 18 feet of pipe length per capita). It was also assumed, for example, that a large system has more miles of sewer, and therefore more overflows in the system as a whole, and would typically need to report an overflow event more often than would a small system.

Ultimately, the nationwide total cost for a provision was calculated by multiplying the per-system cost for systems of a given size range by the number of systems of that size range in the nation and then aggregating across the different system size ranges.

5.1.2 Accounting for current practice that exceeds existing Federal requirements

As discussed in subsection 4.1.3.1, some proposed provisions would create new requirements that are already now being met by some or all communities. The baseline is defined to include the continuation of any current practice that exceeds current Federal requirements. No incremental cost is assigned for the portion of communities that already satisfy a proposed new Federal requirement. For each proposed provision where this is the case, this analysis indicates the proportion of communities of various sizes that is believed to already meet the proposed requirement.[11]

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[11] Note that the analysis attempts to reflect actual current practice by communities or collection systems, not "best practice". Several recent surveys of wastewater utility performance have been conducted to assist in "benchmarking" -- the identification of exemplary performers and the practices they employ in order to establish goals for the industry. In addition to identifying model performance, though, these surveys also provide information on the full range of performance by systems, and it is this data that is used in estimating the extent to which some systems already perform some of the activities

5.1.3 Basic data on separate sanitary sewer collection systems

Costs are estimated for the entire universe of publicly owned sanitary sewer collection systems, including publicly owned satellite collection systems. The1996 Clean Water Needs Survey was used to identify the 19,040 potentially affected separate sanitary sewer collection systems and their service populations. Summary data on these systems is shown below in Table 5-1.

Table 5-1: Collection system statistics

Community Size[1]	# of Systems[1]	Population Served[1]	Estimated Miles in Collection Systems[2]	SSOs/Year[3]	SSOs Per System/Year
< 10,000	16,359	29,000,000	98,864	7,415	0.45
10,000-24,999	1,632	25,300,000	86,250	6,469	3.96
25,000-49,999	604	21,100,000	71,932	5,395	8.93
50,000-249,999	396	40,800,000	139,091	10,432	26.34
250,000-499,999	30	11,100,000	37,841	2,838	94.6
500,0000-999,999	15	10,800,000	36,818	2,761	184.09
Summary > 1,000,000	4	9,900,000	33,750	2,531	632.81
TOTAL	**19,040**	**148,000,000**	**504,545**	**37,841**	**1.99**
Summary > 50,000	445	72,600,000	247,500	18,563	41.71
Included in the above:					
Publicly owned satellite collection systems[4]	4,741				

Sources:
1. Derived, adjusted, and rounded from 1996 CWNS Database
2. 18 feet of pipe length per capita (ASCE, 1998)
3. 75 overflows/1,000 miles (7 studies covering 85 systems)
4. Derived, adjusted, and rounded from 1996 CWNS Database

The universe of collection systems addressed by this rule does not include systems with combined sanitary and storm sewers. There are approximately 950 combined sewer systems, serving about 40 million people.[12] These combined systems are regulated through EPA's CSO control policy, and therefore are not

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that would be required by the proposed new Federal regulations.

[12] EPA's CSO Control Policy -- An Innovative Approach to Controlling Raw Sewage Discharges (http://www.epa.gov/owm/cso.htm).

addressed by this rule.

Approximately 54% of the U.S. population is served by separate sanitary sewers. Most separate sanitary sewer collection systems are small. 86 % of the systems serve fewer than 10,000 people, but in total these very small systems serve only about 20 % of the Nation's separately-sewered population. At the other extreme, 2% of the sanitary sewer collection systems serve more than 50,000 people, but these few larger systems account for nearly half of the population served by separate sanitary sewers.

Costs for some proposed provisions are estimated as a function of the number of SSOs a system experiences (e.g., costs associated with reporting or public notification of SSO events) or the number of miles of sewer pipe a system manages (e.g., costs associated with flow monitoring and assessing capacity). Table 5-1 also shows the nationwide data on SSO frequency and pipe miles that was used in the cost estimating procedures. The estimate of 75 SSO events per year per 1,000 miles of pipe was derived as a rough average across seven studies covering 85 systems.[13]

A national average figure of 18 feet of sewer pipe per capita was estimated..[14] This figure includes only publicly owned collector and interceptor pipe, excluding privately owned building laterals. There is substantial variation across communities around this 18 feet/capita figure, with larger, older and more densely populated communities generally having lesser amounts of pipe per capita, and smaller, newer, rural and dispersed communities having more.

5.1.4 Start-up costs vs. annual costs

Some tasks associated with the proposed rule will be performed once by a system and will not then need to be repeated for several years, for example, developing an overflow response plan. Costs for accomplishing these start-up tasks are represented as capital investments with an estimated useful life (as discussed in Section 5.1.6 below). Other tasks that will need to be repeated on a recurring annual basis by municipal sanitary sewer systems are treated as ongoing annual costs, continuing indefinitely. An example is the cost of reporting overflow events, some number of which are assumed to occur each year for a system as a function of its size.

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[13] The studies are cited in detail in the ICR supporting the proposed rule. They include a compilation of data from 55 systems in Oklahoma, a California study of 8 systems, a study performed by Charlotte-Mecklenburg covering 18 systems, and data from four case studies of large municipal systems with extensive records on their SSOs: Lousiville, KY; Oakland, CA; Charlotte, NC; and the Washington, DC area.

[14] ASCE, 1998.

In order to arrive at a single annualized cost estimate associated with a proposed provision, start-up costs and annual costs were combined using an annualizing approach described in subsection 5.1.6.

5.1.5 Labor costs

Most of the provisions in the proposed rule impose administrative, reporting or planning requirements. In order to comply with these provisions, municipal sanitary sewer systems will need to dedicate staff time to addressing new requirements. Consequently, cost estimates are frequently based on a unit labor cost.

Labor hours for tasks performed by municipal or State employees are priced at $28.00 per hour, including benefits.[15] It is assumed that the average skill level required to perform tasks necessitated by this regulation matches that of the average State and local government worker.

A very small portion of the labor hours prompted by this proposed regulation will be provided by Federal or State workers rather than municipal employees. Most labor hours will be provided by municipal employees of the collection systems that constitute the regulated community. A small number of additional hours will be provided by the NPDES oversight authorities that review the plans and reports generated by the municipalities. Federal employees will be involved only in the eight non-authorized NPDES States where EPA rather than the State is the oversight authority. The labor rate for Federal employees is estimated as $31.98/hr including benefits[16].

5.1.6 Annualization, phase-in, and design life

To estimate the annualized costs of the proposed rule, three steps were applied to the base cost estimates:

1) 'Phase-in' - It is assumed that most of the proposed new requirements will be made

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[15] Source: Bureau of Labor Statistics. Average total compensation per hour worked for all State and local government workers, March, 1999. Http://stats.bls.gov/news.release/ecec.t04.htm. The $28.00 figure includes wages and salaries of $19.78 and benefits of $8.22.

[16] This is calculated as follows. The average current Federal employee salary across all pay grades and steps is $38,380. Assuming that the Federal employee works 1,800 hours per year to earn this salary, the average wage per hour worked is $21.32. Adding 50 % for benefits and overhead gives a loaded cost of $31.98/hour. This rate is consistent with the ICR prepared for this proposed rulemaking (*Information Collection Request for Proposed NPDES Requirements for Municipal Sanitary Sewers and Sanitary Sewer Overflows*, prepared for U.S. EPA by Science Applications International Corporation, February 2000).

applicable to a system at the time at which the system's permit is renewed, and that a system will actually incur all the start-up costs to meet applicable requirements promptly thereafter (see Section 5.1.7). Given the 5-year NPDES permit term and assuming an even pace of permit expirations over the next five years, it is assumed that in the first year after promulgation, 20% of the nation's regulated entities will become subject to the rule and will need to incur start-up costs, another 20 % will be affected in the second year following promulgation, etc. By the end of the fifth year following promulgation, all of the systems will have been affected.

"Ongoing" costs (annual costs that must be incurred each year, continuing indefinitely) are assumed either to begin in the year in which a system's permit expires and the proposed requirements are made applicable to it, or, where appropriate, in the first year thereafter. The cohort of 20% of the systems with permits expiring during the first year following promulgation of the rule would thus incur the start-up costs in year 1 and ongoing costs annually beginning in year 1 (in cases where ongoing costs are expected to start in year 1) or beginning in year 2 (in cases where ongoing costs are expected to start in year 2). Other cohorts would lag this first cohort by up to five years.

2) Useful life. It is assumed that most of the 'start-up' provisions have a useful life of 20 years. In effect, it is assumed that each of the start-up provisions will need to be redone (i.e., the costs will need to be incurred again) every 20 years. These periodic capital expenses are converted to a steady stream annualized cost by applying the capital recovery factor appropriate for a 20-year asset life and a discount rate of 7 % (CRF of .0944).

   The assumption that all 'start-up' costs will need to be re-incurred in 20 years is expected to result in an over-estimate of costs. For virtually every 'start-up' cost element, ongoing costs have also been attributed for activities intended to maintain and update the start-up element. At the end of 20 years a start-up element that has been updated periodically will probably not need to be wholly re-done. Much of the start-up activities represent setting up the framework and data sets necessary for further analysis, and later costs that need to be incurred will be less than the full costs for a new version of the start-up element. A legitimate case could be made that many of the start-up costs have a virtually infinite design life when accompanied by the ongoing cost activities.

3) Discount rate. The OMB-recommended discount rate of 7% per year is applied in converting the estimated stream of start-up and ongoing costs over time into a single annualized cost figure.

All cost estimates shown in this EA represent annualized costs, calculated as described above.

5.1.7 Implementation timing assumptions

5.1.7.1 Baseline timing assumptions

In estimating the costs of the large majority of proposed provisions, a baseline timing assumption was adopted. Under this baseline, the typical or "average" municipality is expected to obtain its renewed NPDES permit in the middle of the year in which the permit is due for renewal. The typical municipality then starts incurring start-up costs 6 months after permit renewal, at the end of the year in which the permit is issued. Depending on the provision, recurring annual costs are either incurred at the same time as start-up costs, or one year later, if no annual costs (such as those associated with updating report summaries) are expected to be incurred in the first year.

This baseline timing assumption is independent of, and supplemental to, the "phase-in" step described in Section 5.1.6. Thus, under the phase-in approach, 20% of the nation's regulated entities will become subject to the proposed rule in the first year after promulgation, and will need to incur start-up costs, another 20 % will be affected in the second year following promulgation, etc. Then, under baseline implementation timing assumptions, the first 20% cohort of municipalities is expected to obtain permits in the middle of year one, and to incur start-up costs at the end of year one. The second 20% cohort will obtain permits in the middle of year two, and to incur start-up costs at the end of year two, etc.

5.1.7.2 Timing assumptions for CMOM documentation requirements

In estimating the costs of the proposed rule, baseline implementation timing assumptions were applied to all provisions with the exception of documentation requirements associated with the proposed Capacity, Management, Operation and Maintenance (CMOM) program. These requirements include:

- A written summary of the CMOM program;
- A written overflow response plan;
- A report summarizing the results of a program audit; and,
- Where necessary, a written system evaluation and capacity assurance plan.

In estimating the costs associated with these requirements, the timing of start-up and recurring annual costs is expected to follow the schedule shown in Table 5-2.

Table 5-2: Recommended deadlines for CMOM documentation requirements

Total Service Population of Permittee's System[1]	Summary of CMOM program	Overflow Emergency Response Plan	Submission of Program Audit Report	System Evaluation and Capacity Assurance Plan (if required)
50,000 or more	within 18 months of permit issuance	within 1 year of permit issuance	within 18 months of permit issuance	initial subbasins within 3 years of permit issuance. All subbasins with 5 years of permit issuance
less than 50,000 but more than 10,000	within 2 years of permit issuance	within 1 year of permit issuance	within 2 years of permit issuance	initial subbasins within 3.5 years of permit issuance. All subbasins with 5 years of permit issuance
10,000 or less	within 4.5 years of permit issuance	within 1 years of permit issuance	within 4.5 years of permit issuance (with permit application)	within 5 years of permit issuance

As is the case under the baseline timing assumptions, the typical or "average" municipality is expected to obtain its permit in the middle of the year in which the permit is due for renewal. Costs are then incurred according to the schedule described in Table 5-2. Similarly, annual costs may be incurred at the same time as start-up costs, or one year later, depending on the provision; and "phase-in" of 20% of the regulated community each year is assumed.

5.2 Summary of the Costs of the Proposed Rule

The total annualized incremental costs of the proposed rule are estimated at $93.5 to $126.6 million per year. This total annualized cost reflects the costs of major provisions in the proposed rule as follows:

- Record keeping: $ 9.0 million
- Reporting and Public Notification: $ 7.1 million
- CMOM general standards: $ 3.9 - $ 4.6 million
- CMOM management program: $ 46.2 - $ 66.1 million
- CMOM overflow response plan: $ 8.2 - $ 18.4 million
- CMOM system evaluation and capacity assurance plan: $ 10.4 - $ 10.6 million
- CMOM program audits: $ 4.4 - $ 6.7 million

- CMOM communications: $ 3.6 million
- Permitting of satellite collection systems: $ 58,000
- Cost to oversight authorities: $492,000.

As can be seen in the breakdown of the costs of the major provisions, a large portion of the costs of the proposed rule (49 - 52 %) are associated with the CMOM management program. Other major provisions that contribute significantly to the costs of the proposed rule are reporting and public notification (14%), the CMOM system evaluation and capacity assurance plan (13%), and the CMOM overflow response plan (12%). A summary of the costs of each individual provision of the proposed rule is provided in Table 5-3. More detailed cost tables which include assumptions, industry practice percentages, and labor hours for each provision, by community size, are provided in Appendix B.

Table 5-3: Range of total annualized costs of the proposed rule, by provision

Provision	Annualized costs ($) by provision (lower estimate)	Annualized costs ($) by category (lower estimate)	Annualized costs ($) by provision (upper estimate)	Annualized costs ($) by category (upper estimate)
RECORD KEEPING AND REPORTING		$8,974,600		$8,974,600
Maintain documentation of performance and implementation measures for the previous 3 years (SEE NOTE 1)				
Prepare and store annual summary report	$546,474		$546,474	
Public notice of annual summary report	$8,423,528		$8,423,528	
Post annual summary report on internet	$4,598		$4,598	
PUBLIC NOTIFICATION		$7,097,294		$7,097,294
Install permanent signage at emergency outfalls	$738,138		$738,138	
Provide public and official notification of SSO event	$6,359,156		$6,359,156	
GENERAL STANDARDS		$3,914,440		$4,638,029
Provide notification to parties with potential for				
Provide written summary of CMOM program	$3,914,440		$4,638,029	
MANAGEMENT PROGRAM		$46,237,464		$66,074,838
Identify elements not applicable to your system	$284,420		$449,487	
Goals	$284,420		$449,487	
Organization				
Identify administrative and maintenance positions	$284,420		$449,487	
Identify chain of communication	$284,420		$449,487	
Include legal authority to (control flows)				
Control I/I	$1,638,353		$1,888,773	

Provision	Annualized costs ($) by provision (lower estimate)	Annualized costs ($) by category (lower estimate)	Annualized costs ($) by provision (upper estimate)	Annualized costs ($) by category (upper estimate)
Require proper sewer design and construction	$762,543		$1,050,074	
Ensure proper installation, testing and inspection	$1,362,619		$1,578,300	
Address flows from municipal satellites	$365,517		$782,883	
Measures and Activities				
Identify responsibilities	$71,105		$112,372	
Management and use of information for prioritizing	$4,431,421		$6,506,839	
Current capacity assessment	$23,246,970		$23,246,970	
Identify/prioritize structural deficiencies and implement	$233,125		$521,026	
Training	$9,391,337		$23,478,343	
Design and performance provisions				
Establish design/installation standards	$343,512		$533,513	
Establish procedures and specifications for	$343,512		$533,513	
Monitor, measure, update CMOM program and summary	$2,909,769		$4,044,283	
OVERFLOW RESPONSE PLAN		$8,212,482		$18,353,309
Develop Overflow Response Plan	$1,451,930		$1,451,930	
Ensure appropriate reporting pursuant to 40 CFR				
Ensure public and agency notification pursuant to 40				
Ensure personnel are aware and trained	$6,760,552		$16,901,379	
SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN		$10,403,442		$10,603,929
Prepare plan	$263,211		$318,869	
Establish capacity enhancement actions (prioritization,	$9,481,238		$9,481,238	
Plan updates	$658,993		$803,822	
CMOM PROGRAM AUDITS	$4,446,735	$4,446,735	$6,714,556	$6,714,556
COMMUNICATIONS	$3,640,973	$3,640,973	$3,640,973	$3,640,973
MUNICIPAL SATELLITE SEWER COLLECTION		$58,153		$58,153
Permit applications	$58,153		$58,153	
COST TO STATE AND FEDERAL PERMITTING	$491,515	$491,515	$491,515	$491,515
GRAND TOTAL	**$93,477,09**	**$93,477,09**	**$126,647,1**	**$126,647,1**

Note 1: Costs under "Record keeping and Reporting" for maintaining documentation of performance and implementation

measures are accounted for in the costs estimated for the following provisions: CMOM program audit; update CMOM plan; and update system evaluation and capacity assurance plan.
Note 2: Costs under "General Standards" for providing notification to parties with potential for exposure are accounted for in the costs estimated for public notification.
Note 3: Costs under "Overflow Response Plan" for ensuring appropriate reporting pursuant to 40 CFR 122.42(e) are accounted for in the costs estimated for reporting.
Note 4: Costs under "Overflow Response Plan" for ensuring public and agency notification pursuant to 40 CFR 122.42(h) are accounted for in the costs estimated for public notification.

5.3 Explanation of the Incremental Costs of the Proposed Rule, Provision by Provision

The following subsections describe, on a topic-by-topic basis, each of the provisions in the proposed rule, and provide the estimated costs associated with each new provision. In addition, important elements considered in estimating costs are highlighted for each provision. Appendices B and C to this Economic Analysis provide more detail on the costing methodologies employed for each provision.

5.3.1 Record keeping and reporting

The new record-keeping and reporting requirements set forth in the rule require that three-year records be maintained for Work Orders associated with SSOs, and for customer and other complaints. Although these requirements are new, there are no new costs associated with these provisions. These record-keeping practices are practiced routinely so as to identify recurring system problems, and in accordance with required Discharge Monitoring Reports (DMRs). Also, all staff activities are typically initiated via work order, and the trigger for each work order (such as a complaint record) is attached to the work order.

WEF Manual of Practice No. 7 *Wastewater Collection System Practice* considers such records essential. Based on the existing good practice of the industry with regard to maintaining records of work orders and customer and other complaints, it is expected that no new costs will be incurred in connection with these two three-year record requirements.

The estimated costs associated with the new requirement to maintain a three-year record of performance and implementation documentation are included in the costs estimated for a number of related provisions in the proposed rule. These provisions include: updating the CMOM Plan; preparing and updating the System Capacity and Enhancement Plan; and performing the CMOM Program Audit.

5.3.2 Public notice of municipal sewer system overflows

Public notification provisions in the proposed regulation state that permittees must, in accord with

the criteria developed in the Overflow Response Plan, immediately notify the public, health agencies, drinking water suppliers and other affected entities of overflows that may imminently and substantially endanger human health. In addition, permittees are required to notify the public of overflows in areas where overflows have a potential to affect human health.

The total annualized costs associated with immediately notifying the public, health agencies, drinking water suppliers and other affected entities of overflows that may imminently and substantially endanger human health are estimated at $738,138 per year. 2 hours[17] per SSO event (scaled by system size) would be required to alert the appropriate parties.

The annualized costs associated with notifying the public of overflows in areas where overflows have a potential to affect human health are estimated at $ 6,359,156 per year. The permittee would take action to notify the public in such a manner as would allow them to avoid exposure to the overflow. Beach/lake closure, flagging with yellow tape, and similar measures may be necessary. An estimated 3 hours per SSO event[18] would be required to limit public access and 2 hours[19] per event to provide media notification. $188 in capital cost per system would be needed to purchase temporary signage for public notice[20].

5.3.2.1 Annual report

Permittees must prepare and make available to the public an annual report of all overflows in the sewer system that includes the date, the location of the overflow, any potentially affected receiving water, and the estimated volume of the overflow. Overflows of less than approximately 1,000 gallons may be summarized together. Systems serving fewer than 10,000 people are not required to file an annual report if all Discharge Monitoring Reports (DMRs) for the preceding 12 months show no discharges from overflows.

The annualized costs associated with preparing and storing the annual report are estimated at $546,474 per year. Preparing the report would require 1 hour of labor time per system, while storing and making available one copy of the report would require another 0.25 hours per system[21].

The additional annualized costs associated with posting the annual report on the Internet, in cases

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[17] Notification process should be similar to CSO requirement. Therefore, labor estimate from the CSO ICR estimate for this task (CSO ICR, 1998).

[18] Based on the CSO ICR estimate for this task (1998).

[19] Based on the CSO ICR estimate for this task (1998).

[20] Based on the CSO ICR capital cost for this task (1998).

[21] The estimate to prepare the report and store and make available the public are based on the CSO ICR labor estimate for this task (CSO ICR, 1998).

where communities already maintain Internet sites, are estimated at $4,598 per year. In the group of systems serving more than 50,000 people, an estimated 90% currently maintain a website. Such systems would each need 0.5 hours to post the annual summary report on the Internet[22]. Arranging publication of the notice of annual summary report would require 0.25 hours per system and an ongoing annual capital cost ranging from $292 O&M per report for municipalities serving fewer than 10,000 people, to $2,000 for municipalities serving over 10,000 people[23].

5.3.3 Capacity, management, operation, and maintenance (CMOM) programs for municipal sanitary sewer systems

The proposed SSO rule would prescribe requirements for implementing a CMOM program for municipal sanitary sewer systems that at a minimum addresses General Standards, a Management Program, an Overflow Response Plan, a System Evaluation and Capacity Assurance Plan, CMOM Program Audits, and Communications. Activities undertaken to achieve compliance with each CMOM requirement[24] are described, along with a summary of the associated costs.

5.3.3.1 General standards

This section would establish a comprehensive framework for a CMOM program which includes both inclusion of existing programs (such as maintenance) and new requirements. Permittees would be required to notify parties with potential for exposure to overflows, to develop a written summary of their CMOM program, and to make the written summary and the CMOM program audit available to the public upon request. Permittees would also be required to modify the written summary to address changes in local conditions or procedures.

The new requirement to establish a general performance standard for public notification derives from the proposed rule's new public notification requirements, the costs of which are addressed in subsection 5.3.2.

The annualized total costs associated with preparing and modifying the written CMOM program summary are estimated at $8,886,621 per year. Municipalities would need to devote between 72 labor

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[22] From the CSO ICR, 1998.

[23] From the CSO ICR, 1998.

[24] Because permit conditions and enforcement actions are under the jurisdiction of the permitting authority, the assumptions set forth here are for analytical purposes only and do not necessarily represent a final Agency determination of what actions would be deemed to constitute an adequate CMOM program for any individual community.

hours (communities under 10,000) to 176 labor hours (communities over 1 million)[25] to develop and complete the summary.

5.3.3.2 CMOM management program

A permittee would be required to develop a CMOM program that complies with the general standards framework described above. Permittees believing that elements of this section are not appropriate or applicable to their system would not be required to implement these elements, provided that they submit a written explanation of their decision. Because the task of identifying non-applicable provisions would require permittees to take time to familiarize themselves with the CMOM provisions, the costs estimated for this task reflect this effort.

The annualized costs associated with identifying those provisions not applicable to the system are estimated at $367,036 per year. Between eight hours (for communities under 10,000) and 34 hours (for communities over 1 million)[26] will be necessary to identify those provisions not applicable to the system.

The CMOM program also would be required to include:

5.3.3.2.1 CMOM program goals

This provision requires permittees to identify their own specific major CMOM program goals consistent with the general standards. The annualized costs to permittees associated with identifying their specific CMOM program goals are estimated at $390,196 per year. Between eight hours (for communities

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[25] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. The estimate for this task assumed that the 250 hour average for the *POTW Pretreatment Program Modification Approval Request* is for a community of 50,000 people. For EA costing purposes, it was estimated that this estimate would range from 144-366 hours based on the population size. For example, the 250 hour estimate was assumed to encompass the following CMOM activities: Provide written summary of CMOM management program, identify elements not applicable to your system, identify goals, identify administrative and maintenance positions, identify chain of communication, and implementing pretreatment program prohibitions. It was estimated that implementing pretreatment provisions would require similar hours as 'control I/I' (40 hours for communities of 50,000-250,000). The labor hours for implementing pretreatment provisions were then subtracted from the total (i.e..250 hours - 40 hours = 210 hours) and the hours were divided among the remaining CMOM elements encompassed by this assumption. It was estimated that approximately 52% of the remaining hours (i.e.. 52% of 210 = 130 hours) would be used for this element.

[26] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

under 10,000) and 36 hours (for communities over 1 million)[27] will be necessary to understand the CMOM program and articulate it into appropriate system-specific goals.

5.3.3.2.2 Identification of positions

Permittees are required to identify administration and maintenance positions responsible for implementing the CMOM program. The annualized costs associated with identifying administration and maintenance positions are estimated at $360,163 per year. Between eight and 24 hours[28] per system is allocated to this provision in recognition that identifying and assigning key responsible positions and revising established job descriptions can be time-consuming.

Permittees are also required to identify the chain of communication for reporting sanitary sewer overflows. The annualized costs associated with identifying the chain of communications are estimated at $366,954 per year. Between eight and 32 hours per system would be needed to comply with this provision[29].

5.3.3.2.3 Include legal authority to control flows

Permittees are required to include legal authority to:

1) Control infiltration and connections from inflow sources;

2) Require the proper design and construction of sewers;

3) Ensure the proper installation, testing, and inspection of sewers;

4) Address flows from municipal satellites collection systems; and

5) Implement the national pretreatment requirements under 40 C.F.R. § 403.5.

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[27] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

[28] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

[29] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

Item 5 is addressed in the discussion on clarifying provisions in Appendix A.

Municipalities implementing this CMOM element would need to: review the proposed SSO rule as a preliminary to preparing a draft ordinance or agreement; prepare the appropriate document, which is subject to internal review by the enforcing municipal agency before it can be finalized; negotiate the agreement with the appropriate entity or introduce a draft ordinance at a municipal council or board meeting; hold public hearings to provide the public and interested parties an opportunity to comment; and enact and enforce the agreement or ordinance.

Enforcement activities under this CMOM element would include reviewing all new non-municipal sewers and connections to treatment works for: inclusion of the engineer's seal ensuring proper design and construction; appropriate installation, testing, and inspection; and the necessary measures taken to meet national pretreatment standards.

The cost estimates for each of these provisions reflect the fact that a percentage[30] of communities have already included legal authority in these areas. This percentage ranges from 10 percent for communities under 10,000 to 75 percent for communities greater than one million.

The total annualized costs associated with including legal authority to control infiltration and connections from inflow sources are estimated at $1,671,272 per year. The number of hours per agreement ranges from 40 to 72 (scaled by community size), with the number of agreements per municipality ranging from 1 for communities under 10,000 to 5 for communities over 50,000.[31]

The annualized costs associated with including legal authority to require that sewers and connections be properly designed and constructed are estimated at from $ 886,137 per year. The number of hours per agreement ranges from 10 (for communities under 250,000) to 64 (for communities over 1 million), with one to five agreements per municipality.[32]

The annualized costs associated with including legal authority to ensure proper installation, testing and inspection of new and rehabilitated sewers are estimated at $ 1,438,019 per year.

The annualized costs associated with including legal authority to address flows from municipal satellites are estimated at $419,820 per year. The number of hours per agreement or ordinance ranges from

[30] Letter of Record, Northern Virginia Planning District Commission, 2000.

[31] Both the number of hours and number of agreements per municipality from Northern Virginia Planning District Commission.

[32] Both the number of hours and number of agreements per municipality from Northern Virginia Planning District Commission.

10 to 64 (scaled by community size), and the number of agreements per municipality ranges from 1 to 5.

5.3.3.2.4 Address various CMOM measures and activities

This proposed provision would create several new requirements, and would also require that existing requirements be reflected in the comprehensive CMOM Program.

First, each permittee must address the measures and activities that are appropriate and applicable to the permittee's system and identify the position responsible for implementing these measures. The annualized costs associated with identifying the appropriate person or position for each element of this provision are estimated at $84,887 per year. 2 to 8[33] labor hours would be required to meet this requirement.

Specific CMOM management program measures and activities newly required under the proposed rule include:

1) Maintaining a map of the collection system;

2) Managing information relevant to establishing and prioritizing appropriate CMOM activities and illustrating trends in overflows;

3) Assessing current system capacity;

4) Identifying, prioritizing, and identifying actions to address structural deficiencies; and

5) Appropriate CMOM program training.

The map maintenance provision requires permittees to maintain a map of the collection system as part of their CMOM management program, and to identify the person or position responsible for map maintenance. This provision creates new requirements which do not appear in existing regulations. However, wastewater utilities are currently meeting the map maintenance requirement in practice. At a minimum, wastewater utilities keep copies of design drawings for their collection system. Some wastewater utilities maintain detailed paper maps of their collection systems, while others use computerized mapping systems. Given this state of practice, EPA considers that permittees will not incur any incremental costs in complying with the proposed map maintenance provision, even though the provision can be considered to create a new regulatory requirement.

[33] Personal communication with Rick Arbour

The proposed management of information provision requires permittees to manage and use timely and relevant information so as to help establish and prioritize appropriate CMOM activities. The annualized costs associated with management of information are estimated at $5,502,074 annually. 'Start-up' measures to identify and illustrate trends in overflows would require between 40 and 60[34] hours of time for municipal employees. Start-up costs for using timely, relevant information to establish and prioritize CMOM activities and identifying trends in overflows each of the two provisions would require 2 hours (for communities under 10,000) to 16 hours (for communities over 1 million)[35] per year.

The proposed provision addressing capacity requires that permittees' CMOM programs address assessment of collection system and treatment facility current capacity. The annualized costs associated with current capacity assessment are estimated at $23,246,970 per year. The cost estimate for this provision reflects many factors and calculations, which are discussed in Appendix B.

The proposed provision addressing structural deficiencies requires that permittees identify and prioritize structural and hydraulic deficiencies, and identify and implement short-term and long-term rehabilitation actions to address each deficiency. The annualized costs associated with this provision are estimated at $382,715 per year. Revising rehabilitation plans to highlight problem areas for prioritization would require between 16 and 40 labor hours[36] at start-up. Ongoing costs to revise rehabilitation plans to highlight problems areas would require between 8 and 40 labor hours/year[37]. 92% of communities in all size categories are expected to implement this element[38].

The provision addressing training requires permittees to ensure that their employees and other appropriate parties are properly trained -- and retrained, through refresher training -- on safe procedures and the implementation of the permittee's CMOM management program. The annualized costs associated with training are estimated at $16,434,840 per year. Wastewater personnel are expected to require four hours of management plan training and four hours of 'other' training. Training costs were estimated based on a cost per hour of $20.34[39] and a 28-hour training requirement.[40] Ongoing costs for refresher training are estimated at 50% that of the original training. 100% of staff for communities less than 250,000 would need training, while 50% of staff for municipalities greater than 250,000 would be trained. The number of personnel requiring training will vary from 2.0 (for communities under 10,000) to 71.3 (for communities over

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[34] Personal communication with Rick Arbour

[35] Personal communication with Rick Arbour, California State University (2000)

[36] Vendor Information

[37] Vendor Information

[38] Arbour and Kerri, 1998

[39] Training cost per hour estimate for on-site confined space entry training quote provided by All-American Environmental Services assuming a class size of 6 people, 1998.

[40] Collection systems training time estimate from Arbour and Kerri, 1998.

1 million).

5.3.3.2.5 Design and performance

The design and performance provisions in the proposed regulation require permittees to establish requirements and standards governing the installation of new sewers, pumps, other appurtenances, and for rehabilitation and repair projects. The annualized costs associated with this requirement are estimated at $396,344 per year. To meet this requirement, municipalities would need to draft an ordinance (many model ordinances are available) and attend public hearings related to the design and performance provisions. An estimated 55% of communities already have such an ordinance[41]. Drafting the ordinance is expected to take either 12 or 18 hours, while holding public hearings would take between 6 and 60 hours.[42]

Another proposed design and performance provision requires permittees to establish procedures and specifications for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects. The annualized costs associated with this requirement are estimated at $396,344 per year. An estimated 55% of municipalities already have such provisions and specifications[43]. The tasks and estimate of hours follow closely with those required to establish requirements and standards for the installation of new sewers.

5.3.3.2.6 Monitoring, measurement and program modifications

The provisions governing monitoring, measurement and program modifications require permittees to monitor the implementation and, where appropriate, measure the effectiveness of each element of the CMOM program. CMOM program elements are also required to be updated as appropriate based on monitoring or performance evaluations, and the CMOM program summary must be modified as appropriate to keep it updated and accurate.

The annualized costs associated with monitoring, measurement and program modifications are estimated at $3,409,696 per year. Special emphasis is placed on this element and its costing, as the intent of the Agency is to acknowledge the utilities' professionalism, judgement, and responsibility to manage the collection system effectively. In accordance with this principle, ongoing costs equaling 2% of the cost of the Management Program[44] were allocated to program evaluation and revision -- a level of spending that is expected to enable utilities to target available resources most cost-effectively.

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[41] From Draft Guidebook on State Standards, Parsons ES (2000)

[42] Field data, Northern Virginia Planning District Commission, (2000)

[43] From *Guidebook on State Standards*, Parsons ES (2000)

[44] Nexus Associates (2000)

5.3.3.3 Overflow response plan

Permittees are required to develop and implement an Overflow Response Plan identifying mechanisms to ensure that:

1) Pursuant to proposed notification requirements, appropriate notification is made to the public, health agencies, and other impacted entities (e.g. water suppliers); and

2) Appropriate personnel are aware of and follow the Overflow Response Plan and are appropriately trained.

The annualized costs associated with developing an Overflow Response Plan are estimated at $2,341,823 per year. An estimated 38% of communities in all size categories already have a sewer overflow response plan (SORP)[45]. All communities under 10,000 are expected to buy a model SORP from the American Public Works Association (APWA). An estimated 25% of communities between 10,000 and 25,000, 50% of communities between 25,000 and 50,000, and 75% of communities over 50,000 are expected to implement a SORP tailored to the municipality. A tailored SORP developed by a consultant was estimated to cost $25,000[46]. The model APWA SORP costs $65[47] and would require eight labor hours for implementation.

The annualized costs of ensuring appropriate notification, as defined in the proposed notification requirements, are addressed in subsection 5.3.2.

The annualized costs associated with ensuring that appropriate personnel are aware of and follow the Overflow Response Plan and are appropriately trained are estimated at $11,830,965 per year. An estimated 38% [48] of municipalities currently provide such general training for their O&M staff (Arbour and Kerri, 1998). The training cost assumptions reflect the assumptions utilitized in estimating CMOM training costs. That is, training costs were estimated at $20.34[49] per hour, and it was estimated that wastewater personnel would need 28 hours[50] of overflow response training. The number of personnel requiring training

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[45] Survey data by Arbour and Kerri (1998) indicating percentage of respondents documenting the existence of established written procedures for containing and evaluating overflows.

[46] Estimate based on discussions with APWA SSO Focus Group members

[47] The APWA cost for the model SORP (including diskette) to non-APWA members is $65.

[48] Survey data by Arbour and Kerri, 1998 indicating percentage of respondents documenting the existence of established written procedures for containing and evaluating overflows.

[49] Training cost per hour estimate for on-site confined space entry training quote provided by All-American Environmental Services assuming a class size of 6 people

[50] Arbour and Kerri, 1998

was estimated to be 100% for communities less than 250,000 and 50% for communities greater than 250,000. The number of O&M staff requiring training varies from 2.0 for communities under 10,000 to 71.3 for communities over 1 million.

Overflow response plan measures which clarify existing requirements are addressed in Appendix A.

5.3.3.4 System evaluation and capacity assurance plan

The proposed rule would require permittees to prepare and implement a plan for system evaluation and capacity assurance if peak flow conditions are contributing to an SSO discharge *unless* they have either:

1) Already taken steps to correct the hydraulic deficiency; or

2) The discharge is caused by severe natural conditions (as defined in the proposed provision on such discharges – see Appendix A).

The total annualized costs associated with preparing a system evaluation and capacity assurance plan were estimated at $291,054 per year. Start-up measures for preparing a system evaluation and capacity assurance plan would require an estimated 20 hours (for communities under 10,000) to 80 hours (for communities over 1 million)[51]. Appendix B provides more information on the several costing factors that were considered in estimating the costs of this provision.

5.3.3.4.1 Capacity enhancement measures

Proposed capacity enhancement provisions require permittees to establish short- and long-term actions to address each hydraulic deficiency including prioritization, alternative analysis, and a schedule. The annualized costs associated with capacity enhancement were estimated at $9,481,2389. An estimated 16.4%[52] of the industry already performs the provisions under this section (in all population categories). Using the Pareto rule, it is expected that problem areas are found in 25% of system length. The labor hours required for this ongoing cost range from 40 hours for communities under 10,000 to 88 hours for

[51] It was assumed that the labor required for this task would be similar to of CMOM program audits. The labor estimate for conducting CMOM progam audits is based on personal communication with Rick Arbour.

[52] The percentage of sewers greater than 50 years old as identified in *Optimization of Collection System Maintenance Frequencies and System Performance* (ASCE, 1998)

communities over 1 million[53].

5.3.3.4.2 Plan updates

The proposed rule requires that the system evaluation and capacity assurance plan be updated to describe any significant change in proposed actions and/or implementation schedule, and to reflect available information on the performance of measures that have been implemented. The annualized costs associated with plan updates were estimated at $723,180. An estimated 12 to 24 labor hours per year would be required for this ongoing annual activity.

5.3.3.5 CMOM program audits

Proposed CMOM Program Audit provisions would require permittees to conduct compliance audits, beginning with permit issuance under CMOM and then every five years, to evaluate their implementation of the CMOM requirements. An audit would be required in the start-up year, soon after permit issuance, to identify strengths and deficiencies in the municipality's existing program as compared to the new requirements, and steps to respond to deficiencies. To comply with the proposed requirements, it was assumed that permittees (or their consultants) would conduct all interviews and evaluate all CMOM program provisions.

The annualized costs associated with CMOM program audits are estimated at $730,700 per year. Municipalities would require between 40 and 120 hours to perform a CMOM program audit and prepare a report. Ongoing costs, for subsequent years, are assumed to be 20% of the first audit in the start-up year.

5.3.3.6 Communications

The proposed communications provision requires permittees to communicate with interested parties on a regular basis regarding the implementation and performance of the CMOM program. Communication systems should allow interested parties to provide input to the permittee as the CMOM program is developed and implemented.

The annualized costs associated with the communications provision are estimated at $3,640,973. Most utilities are expected to already use public outreach materials such as newsletters and, where appropriate, websites. It is also expected that the Public Information Officer has an address list of interested parties (in addition to ratepayers) who have asked to be kept apprized of specific matters such as spills, and that the address list might be somewhat expanded under this new requirement. The costs of this provision

[53] Based on Parsons Engineering Science experience with several municipal clients

are estimated based on a unit cost of $0.03/per person[54] .

5.3.4 Satellite sewer collection systems

The proposed rule states that municipal satellite sewer collection systems are point sources subject to the NPDES program. It defines municipal satellite sewer collection systems as any device or system that meets each of the following criteria:

- It is owned by a State or municipality;
- It is used to convey municipal sewage or industrial waste to a treatment facility that has or has applied for a NPDES permit; and
- The operator is not the owner or operator of the treatment facility that has or has applied for a NPDES permit.

By stating that municipal satellite sewer collection systems are point sources subject to the NPDES program, the proposed satellite provisions also clarifies that all proposed requirements which are applicable to sanitary sewer collection systems generally are applicable to municipal satellite sewer collection systems. Accordingly, the 4,741 publicly-owned municipal satellite sewer collection systems are included in the set of sanitary sewer collection systems for which the incremental costs of all new requirements in the proposed rule are calculated. These costs are considered on a provision-by-provision basis in Section 5.3.

The proposed rule requires that municipal satellite collection systems without a permit must submit a complete permit application. This does not include municipal satellite collection systems covered by a general permit under existing regulations applying to combined satellite sewer systems (40 CFR 122.28). Satellite systems that discharge to waters of the United States are currently subject to NPDES requirements, as discussed in subsection 4.3.6. By requiring that satellite systems not covered by a general permit submit a permit application, the proposed rule better ensures that the "no unauthorized discharge" standard for satellite systems is achieved.

Although some communities may currently permit a portion or all of their municipal satellite systems, this analysis counts all satellite systems in estimating the cost of permitting in order to ensure that the incremental costs associated with this provision are not underestimated. The annualized costs associated with satellite permit applications are estimated at $23,975. 90% of permittees are expected to prepare a notice of intent under the general permit, a task that would involve 2 labor hours/system. The other 10%

[54] Communications costs from the Storm Water Phase II Economic Analysis (1999), scaled down to eliminate volunteer monitoring.

of permittees would prepare a full permit application, which would require 5 labor hours per system.

The proposed satellite provisions would also specifically clarify that NPDES permits must require that CMOM programs be implemented in all municipal satellite collection systems. The permittee responsible for CMOM program implementation in a municipal satellite collection system may either be: 1) the owner of the municipal satellite collection system; or 2) the regional collection system that accepts flows from the municipal satellite collection system. Specific responsibilities would be clarified on a case-by-case basis.

The annualized costs associated with CMOM program implementation for municipal satellite collection systems are included in the CMOM program costs for all sanitary sewer systems. These costs are addressed in subsection 5.3.3.

5.4 Incremental Costs of the Proposed Rule by Community Size and by Household

The costs associated with each new requirement in the proposed rule vary according to community size. For each provision in the proposed rule which adds a new requirement and imposes new, incremental costs, Tables 5-4(a) and 5-4(b) present estimated costs, by community size. Table 5-4(a) displays the lower end of the range of estimated costs for each provision, and Table 5-4(b) presents the upper end of the range of estimated costs for each provision.

Table 5-4(a): Total annualized costs of the proposed rule, by community size (lower estimates)

Provision	<10,000	10,000 to 24,999	25,000 to 49,999	50,000 to 249,999	250,000to 499,999	500,000 to 999,999	= > 1 million	Annualized Costs ($) for All Community Size Categories
RECORD KEEPING AND REPORTING								
Maintain documentation of performance and implementation measures for the previous 3 years (SEE NOTE 1)								
Prepare and store annual summary report	$469,526	$46,841	$17,336	$11,366	$861	$431	$115	$546,474
Public notice of annual summary report	$4,011,090	$2,685,975	$994,074	$651,744	$49,375	$24,687	$6,583	$8,423,528
Post annual summary report on internet	$0	$0	$0	$4,092	$310	$155	$41	$4,598
PUBLIC NOTIFICATION								
Install permanent signage at emergency outfalls	$144,635	$126,182	$105,235	$203,487	$55,360	$53,864	$49,375	$738,138
Provide public and official notification of SSO event	$1,429,821	$1,063,456	$875,897	$1,682,444	$456,593	$444,064	$406,900	$6,359,156
GENERAL STANDARDS								
Provide notification to parties with potential for exposure (SEE								
Provide written summary of CMOM program	$2,104,257	$239,789	$317,821	$1,091,111	$93,681	$52,351	$15,430	$3,914,440
MANAGEMENT PROGRAM								
Identify elements not applicable to your system	$212,736	$35,372	$18,327	$15,449	$1,430	$845	$260	$284,420

Provision	<10,000	10,000 to 24,999	25,000 to 49,999	50,000 to 249,999	250,000to 499,999	500,000 to 999,999	= > 1 million	Annualized Costs ($) for All Community Size Categories
Goals	$212,736	$35,372	$18,327	$15,449	$1,430	$845	$260	$284,420
Organization								
Identify administrative and maintenance positions	$212,736	$35,372	$18,327	$15,449	$1,430	$845	$260	$284,420
Identify chain of	$212,736	$35,372	$18,327	$15,449	$1,430	$845	$260	$284,420
Include legal authority to								
Control I/I	$1,180,687	$258,566	$96,218	$94,411	$4,958	$2,723	$791	$1,638,353
Require proper sewer design and construction	$638,209	$84,184	$23,564	$15,106	$4,958	$488	$147	$762,543
Ensure proper installation, testing and inspection	$1,180,687	$129,283	$32,073	$18,882	$845	$545	$158	$1,362,619
Address flows from municipal satellites	$159,552	$90,197	$49,091	$60,080	$3,657	$2,235	$704	$365,517
Measures and Activities								
Identify responsibilities	$53,184	$8,843	$4,582	$3,862	$358	$211	$65	$71,105
Management and use of information for prioritizing	$3,445,901	$129,283	$259,122	$173,721	$17,796	$10,000	$2,925	$4,431,421
Current capacity assessment	$4,576,752	$3,992,821	$3,219,736	$6,439,016	$1,751,79	$1,704,44	$1,562,40	$23,246,970
Identify/prioritize structural deficiencies and implement rehabilitation actions for each deficiency	$146,373	$39,280	$22,833	$20,958	$2,041	$1,247	$393	$233,125
Training	$5,189,984	$2,621,571	$325,758	$1,017,629	$81,376	$109,810	$45,209	$9,391,337
Design and performance provisions								
Establish design/installation standards	$239,328	$39,793	$20,618	$19,531	$21,242	$1,902	$1,097	$343,512

Provision	<10,000	10,000 to 24,999	25,000 to 49,999	50,000 to 249,999	250,000to 499,999	500,000 to 999,999	= > 1 million	Annualized Costs ($) for All Community Size Categories
Establish procedures and specifications for	$239,328	$39,793	$20,618	$19,531	$21,242	$1,902	$1,097	$343,512
Monitor, measure, update CMOM program and summary	$1,800,309	$427,787	$183,598	$314,579	$70,822	$61,071	$51,603	$2,909,769
OVERFLOW RESPONSE PLAN								
Develop Overflow Response	$219,346	$489,645	$354,335	$345,814	$26,198	$13,099	$3,493	$1,451,930
Ensure appropriate reporting pursuant to 40 CFR 122.42(e) (SEE NOTE 3)								
Ensure public and agency notification pursuant to 40 CFR 122.42(h) (SEE NOTE 4)								
Ensure personnel are aware and trained	$4,282,259	$1,174,814	$268,783	$839,646	$67,143	$9,0604	$37,302	$6,760,552
SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN								
Prepare plan	$214,353	$26,834	$11,737	$8,961	$769	$430	$127	$263,211
Establish capacity enhancement actions (prioritization, alternatives, schedule)	$6,811,200	$1,431,969	$638,443	$517,676	$47,772	$26,113	$8,065	$9,481,238
Plan updates	$514,270	$77,009	$35,626	$27,860	$2,435	$1,380	$411	$658,993
CMOM PROGRAM AUDITS	$2,613,310	$445,114	$698,879	$592,223	$54,836	$32,403	$9,970	$4,446,735
COMMUNICATIONS	$713,434	$622,409	$519,085	$1,003,728	$273,073	$265,693	$243,552	$3,640,973
MUNICIPAL SATELLITE SEWER COLLECTION								
Permit applications	$50,059	$5,001	$1,846	$1,211	$35	$0	$0	$58,153

Provision	<10,000	10,000 to 24,999	25,000 to 49,999	50,000 to 249,999	250,000to 499,999	500,000 to 999,999	= > 1 million	Annualized Costs ($) for All Community Size Categories
GRAND TOTAL	**$43,278,799**	**$16,830,598**	**$9,170,214**	**$15,240,46**	**$3,111,28**	**$2,905,21**	**$2,449,00**	**$92,985,582**

Note 1: Costs under "Record keeping and Reporting" for maintaining documentation of performance and implementation measures are accounted for in the costs estimated for the following provisions: CMOM program audit; update CMOM plan; and update system evaluation and capacity assurance plan.

Note 2: Costs under "General Standards" for providing notification to parties with potential for exposure are accounted for in the costs estimated for public notification.

Note 3: Costs under "Overflow Response Plan" for ensuring appropriate reporting pursuant to 40 CFR 122.42(e) are accounted for in the costs estimated for reporting.

Note 4: Costs under "Overflow Response Plan" for ensuring public and agency notification pursuant to 40 CFR 122.42(h) are accounted for in the costs estimated for public notification.

Table 5-4(b): Total annualized costs of the proposed rule, by community size (upper estimates)

Provision	<10,000	10,000 to 24,999	25,000 to 49,999	50,000 to 249,999	250,000 to 499,999	500,000 to 999,999	= > 1 million	Annualized Costs ($) for All Community Size Categories
RECORD KEEPING AND REPORTING								
Maintain documentation of performance and implementation measures for the previous 3 years (SEE NOTE 1)								
Prepare and store annual summary report	$469,526	$46,841	$17,336	$11,336	$861	$431	$115	$546,474
Public notice of annual summary report	$4,011,09	$2,685,975	$994,074	$651,744	$49,375	$24,687	$6,583	$8,423,526
Post annual summary report on internet	$0	$0	$0	$4,092	$310	$155	$41	$4,598
PUBLIC NOTIFICATION								
Install permanent signage at emergency	$144,635	$126,182	$105,235	$203,487	$55,360	$53,864	$49,375	$738,138
Provide public and official notification of SSO event	$1,429,821	$1,063,456	$875,897	$1,885,931	$456,593	$444,046	$40,6900	$6,359,156
GENERAL STANDARDS								
Provide notification to parties with potential for exposure (SEE NOTE 2)								
Provide written summary of CMOM	$2,571,87	$283,387	$366,716	$203,487	$104,70	$57,862	$16,899	$4,638,029
MANAGEMENT PROGRAM								
Identify elements not applicable to your	$354,561	$49,520	$23,564	$18,882	$1,691	$975	$295	$449,487
Goals	$354,561	$49,520	$23,564	$18,882	$1,691	$975	$295	$449,487
Organization								
Identify administrative and maintenance	$354,561	$49,520	$23,564	$18,882	$1,691	$975	$295	$449,487
Identify chain of communication	$354,561	$49,520	$23,564	$18,882	$1,691	$975	$295	$449,487
Include legal authority to (control flows)								
Control I/I	$1,372,14	$294,645	$108,000	$104,710	$5,446	$2,967	$856	$888,773
Require proper sewer design and construction	$893,493	$108,237	$28,800	$17,852	$5,446	$553	$813	$1,050,074

Provision	<10,000	10,000 to 24,999	25,000 to 49,999	50,000 to 249,999	250,000 to 499,999	500,000 to 999,999	= > 1 million	Annualized Costs ($) for All Community Size Categories
Ensure proper installation, testing and inspection	$1,372,149	$147,322	$36,600	$20,942	$975	$553	$0	$1,578,300
Address flows from municipal satellites	$478,657	$150,329	$68,727	$77,245	$4,470	$2,641	$813	$782,883
Measures and Activities								
Identify responsibilities	$88,640	$12,380	$5,891	$4,721	$423	$244	$74	$112,372
Management and use of information for prioritizing CMOM activities & illustrating	$5,232,031	$700,143	$325,068	$21,3785	$20,941	$11,543	$3,328	$6,506,839
Current capacity assessment	$4,576,75	$3,992,821	$3,219,73	$6,439,01	$175,17	$1,704,44	$1,562,40	$23,246,970
Identify/prioritize structural deficiencies and implement rehabilitation actions for each deficiency	$393,735	$63,957	$31,966	$26,945	$2,495	$1,474	$454	$521,026
Training	$12,974.9	$6,553,928	$814,395	$2,544.07	$203.44	$274,525	$113,022	$23,478,343
Design and performance provisions								
Establish design/installation standards	$398,881	$55,710	$26,509	$23,871	$25,105	$2,194	$1,244	$533,513
Establish procedures and specifications for inspection/testing	$398,881	$55,710	$26,509	$23,781	$25,105	$2,194	$1,244	$533,513
Monitor, measure, update CMOM program and summary	$2,604,789	$614,209	$223,828	$398,529	$78,731	$69,258	$54,938	$4,044,283
OVERFLOW RESPONSE PLAN								
Develop Overflow Response Plan	$219,346	$489,645	$354,335	$345,814	$26,198	$13,099	$3,493	$1,451,930
Ensure appropriate reporting pursuant to 40 CFR 122.42(e) (SEE NOTE 3)								
Ensure public and agency notification pursuant to 40 CFR 122.42(h) (SEE NOTE 4)								
Ensure personnel are aware and trained	$1,070,56	$29,37,034	$671,958	$2,099,11	$16,785	$226,511	$93,255	$16,901,379

Provision	<10,000	10,000 to 24,999	25,000 to 49,999	50,000 to 249,999	250,000 to 499,999	500,000 to 999,999	= > 1 million	Annualized Costs ($) for All Community Size Categories
SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN								
Prepare plan	$26,1987	$31,713	$13,543	$10,156	$860	$475	$136	$318,869
Establish capacity enhancement actions (prioritization, alternatives, schedule)	$6,811,200	$14,31,969	$638,443	$517,676	$47,772	$26,113	$8,065	$9,481,238
Plan updates	$628,553	$96,262	$42,104	$32,147	$2,760	$1,542	$455	$803,822
CMOM PROGRAM AUDITS	$4,335,51	$623,159	$898,559	$723,829	$64,806	$37,388	$1,1299	$6,714,556
COMMUNICATIONS	$713,434	$622,409	$519,085	$1,003,72	$273,07	$265,693	$24,3552	$3,640,973
MUNICIPAL SATELLITE SEWER COLLECTION SYSTEMS								
Permit applications	$50,059	$5,001	$1,846	$1,211	$35	$0	$0	$58,153
GRAND TOTAL	$64,576,042	$23,390,506	$10,508,813	$18,494,488	$3,377,369	$3,228,400	$2,580,063	**$126,155,681**

Note 1: Costs under "Record keeping and Reporting" for maintaining documentation of performance and implementation measures are accounted for in the costs estimated for the following provisions: CMOM program audit; update CMOM plan; and update system evaluation and capacity assurance plan.

Note 2: Costs under "General Standards" for providing notification to parties with potential for exposure are accounted for in the costs estimated for public notification.

Note 3: Costs under "Overflow Response Plan" for ensuring appropriate reporting pursuant to 40 CFR 122.42(e) are accounted for in the costs estimated for reporting.

Note 4: Costs under "Overflow Response Plan" for ensuring public and agency notification pursuant to 40 CFR 122.42(h) are accounted for in the costs estimated for public notification.

The average cost per system of the proposed rule varies with the size of the system. Average per system annualized costs are summarized in Table 5-5 as follows:

Table 5-5: Range of average per system annualized costs

Community Size	Average Annualized Cost Per System (lower estimates)	Average Annualized Cost Per System (upper estimates)
< 10,000	$2,646	$3,947
10,000 to 24,999	$10,313	$14,332
25,000 to 49,999	$15,182	$17,399
< 50,000	$3,726	$5,296
50,000 to 249,000	$38,486	$46,703
250,000 to 499,999	$103,710	$112,579
500,000 to 999,999	$193,681	$215,227
> 1,000,000	$612,251	$645,016
$50,000	$53,272	$62,203
all communities	$4,884	$6,626

The typical costs per household and per individual also vary with the size of the system. As indicated in Table 5-6, annualized costs per household range from $0.66 in the largest systems to $4.87 in the smallest systems, with an average nationwide cost per household of $1.92. Per-household costs are relatively higher for small communities for two reasons. First, some fixed costs must be incurred by all communities, regardless of size. In smaller communities, these fixed or base costs account for a significant portion of total costs, and are spread over fewer people than in larger communities, resulting in relatively higher per-household costs. Second, although the number of labor hours required to comply with each of the new requirements does increase with community size, it does not increase proportionally with community size, because wastewater utilities serving larger communities benefit to some extent from economies of scale.

Table 5-6: Cost of the proposed rule per household (using midpoint cost estimates)

Community Size	Number of Systems (1)	Population Served (1)	Avg # of Households per System (2)	Annual Cost Per Household
< 10,000	16,359	29,000,000	677	$4.87
10,000 to 24,999	1,632	25,300,000	5,917	$2.08
25,000 to 49,999	604	21,100,000	13,334	$1.19
50,000 to 249,000	396	40,800,000	39,325	$1.03
250,000 to 499,999	30	11,100,000	141,221	$0.75
500,000 to 999,999	15	10,800,000	274,809	$0.74
= > 1,000,000	4	9,900,000	944,656	$0.66
Summary: < 50,000	18,595	75,400,000	1,548	$2.91
Summary: $50,000	445	72,600,000	62,269	$0.89
Summary: all communities	19,040	148,000,000	2,967	$1.92

Notes: (1) Parsons Engineering Science/1996 Clean Water Needs Survey database
(2) Assumes 2.62 persons per household (Source: U.S. Census Bureau, Current Population Survey Reports, Household and Family Characteristics: March 1998 (Update)(P20-515), Table 16, Households by Type, Tenure, and Race and Hispanic Origin of Householder).

5.5 Impacts of the Proposed Rule on Household Costs for Sewer Service

Compliance costs for sanitary sewer collection systems may be passed through to users of these systems in the form of increased sewer rates. Table 5-6 provides the cost of the proposed rule per household for the average system in each community size category. Table 5-7 then shows these costs in comparison with annual average household expenditures on sewer service.

The average residential charge for sewer services in 1994 was $2.32 per 1000 gallons.[55] An average person generates 100 gallons of wastewater per day[56]. Assuming 2.62 persons per household[57], the average household generates 262 gallons of wastewater per day, or 95,630 gallons per year. Based on an average residential charge for sewer services of $2.64 per 1000 gallons (updated to 1999 dollars)[58], the average household spends approximately $252 per year on sewer service. This estimate is consistent with the results of a recent study of sewer rates in 14 sample communities by the Association of Metropolitan Sewerage Agencies (AMSA). The average annual residential expenditure on wastewater services across communities served by separate sanitary sewer systems was $212.[59]

In practice, the costs of the proposed rule will be borne in most systems not only by residential households, but also by industrial and commercial users that discharge to municipal sanitary sewer systems. In some communities where sewer rates do not fully cover the costs of wastewater services, the taxpayers who support the wastewater utility will also share in paying for the costs of the rule. These taxpayers may or may not be sewer users. In any of these cases, entities other than households served by the collection system will likely pay some of the compliance costs. As a result, the increases in household sewer service expenditures shown in Table 5-7 represent a worst-case estimate, and are probably higher than the increases that households would ultimately face in most systems if costs are indeed passed through.

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[55] Water Environment Federation Manual of Practice No. 7, 5th Edition, 1999. The WEF manual reported a charge of $16.24 per 7000 gallons, which was converted to a per-thousand-gallon figure.

[56] Metcalf & Eddy, Inc. 1991. *Wastewater Engineering: Treatment, Disposal and Reuse.* 3rd edition, revised by George Tchobanoglous and Franklin L. Burton. McGraw-Hill Inc.

[57] U.S. Census Bureau, Current Population Survey Reports, Household and Family Characteristics: March 1998 (Update)(P20-515), Table 16, Households by Type, Tenure, and Race and Hispanic Origin of Householder

[58] The average seasonally-adjusted CPI for all urban consumers over the 12 months of 1994 was 148.3 (1982-84 =100). The latest seasonally-adjusted CPI figure (December 1999) is 168.8 (http://www.stls.frb.org/fred/data/cpi/cpiaucsl). 1994 dollars are therefore adjusted by 14% to account for inflation ((168.8-148.3)/148.3 = 14%).

[59] *The Cost of Clean: A National Survey of Municipal Wastewater Management Needs*, Association of Metropolitan Sewerage Agencies (AMSA), 1997. The AMSA database which was developed in conjunction with the AMSA sewer rate study was provided to Parsons Engineering Science, and was used in calculating the average expenditure on sewer services. Some of the communities surveyed by AMSA have combined sewer systems rather than separate sanitary sewer systems. In calculating the average sewer expenditure from AMSA's survey, this analysis considered only those communities served by separate sanitary sewer systems.

Table 5-7: Percentage increase in household expenditures on sewer service

Community Size	Cost of the Proposed Rule Per Household	Current Average Annual Household Expenditures on Sewer Service	Percentage Increase in Expenditures on Sewer Service Associated with the Proposed Rule
< 10,000	$4.87	$252	1.93%
10,000 to 24,999	$2.08	$252	0.83%
25,000 to 49,999	$1.19	$252	0.47%
50,000 to 249,000	$1.03	$252	0.41%
250,000 to 499,999	$0.75	$252	0.30%
500,000 to 999,999	$0.74	$252	0.29%
> 1,000,000	$0.66	$252	0.26%
Summary: < 50,000	$2.91	$252	1.15%
Summary: $50,000	$0.89	$252	0.35%
Summary: all communities	$1.92	$252	0.76%

As indicated in Table 5-7, the proposed rule will impose costs ranging from $0.66 per year for the average household in the largest communities to $4.87 per year in the average household in the smallest communities. These costs will result in worst-case increases in household expenditures on sewer service ranging from 0.26% for households in communities of 1 million people or more, to 1.93 % for households in communities of 10,000 or less.

5.6 Incremental Costs of the Proposed Rule to State and Federal Oversight Authorities

This section estimates the cost to oversight authorities (States or EPA, depending on whether or not the State is authorized to conduct the NPDES program) to review the materials that communities would be newly required to submit under the proposed rule. The following items would be expected to require review by the oversight authorities:

- Full permit applications submitted by eligible satellite systems;
- Notices of Intent (NOI) submitted by eligible satellite systems for coverage under general permits;
- Summaries of CMOM management programs submitted by all municipal sanitary sewer collection systems, including satellite systems;
- Overflow response plans submitted by all systems;
- System evaluation and capacity assurance plans submitted by all systems;
- CMOM program audits submitted by all systems; and
- Annual SSO summary reports submitted by all systems.

Table 5-8 shows the calculations that were made to estimate the incremental cost of the proposed rule for oversight authorities. Cost calculations were based on the expected timing of submittals to the oversight authorities, as described in Section 5.1.7. In estimating costs, one simplifying assumption was implemented – all systems are assumed to submit all required materials, notwithstanding provisions in the proposed rule that exempt small systems from these requirements if they do not experience SSOs. As a result, the incremental costs to State and Federal oversight authorities presented in Table 5-8 are probably slightly overstated. Several other key costing factors reflected in the cost calculations are as follows:

1) 90% of all satellite systems are expected to submit a notice of intent (NOI) under a general permit. The remaining 10% will submit full permit applications[60];

2) 33% of all sanitary sewer systems have capacity-related SSOs, and are therefore expected to submit system evaluation and capacity assurance plans[61];

3) 78% of all hours spent reviewing materials are attributed to States, and the remaining 22% to EPA, based on the nationwide percentage of States in which EPA is the NPDES

[60] Kevin Weiss, EPA (cited in *Information Collection Request for Proposed NPDES Requirements for Municipal Sanitary Sewers and Sanitary Sewer Overflows*, prepared for U.S. EPA by Science Applications International Corporation (SAIC), February 2000.

[61] Ibid.

authority[62].

4) The average number of hours per review for each item was obtained directly from, or calculated based on, the Information Collection Request for the proposed rule.[63]

The total annualized incremental costs to State and Federal oversight authorities are estimated at $491,515 per year. State oversight authorities account for $371,756 of this total, and EPA accounts for the remaining $119,759. These costs are added to the incremental costs of the proposed rule for municipalities to estimate the total incremental costs associated with the proposed rule.

[62] *Information Collection Request for Proposed NPDES Requirements for Municipal Sanitary Sewers and Sanitary Sewer Overflows*, prepared for U.S. EPA by Science Applications International Corporation (SAIC), February 2000, citing 3/11/1998 Burden Estimate.

[63] *Information Collection Request for Proposed NPDES Requirements for Municipal Sanitary Sewers and Sanitary Sewer Overflows*, prepared for U.S. EPA by Science Applications International Corporation (SAIC), February 2000. SAIC provided to Environomics a "steady state" spreadsheet on Federal and state costs, based on assumptions in the Information Collection Request (ICR). For permit applications, notices of intent, overflow response plans, and annual SSO summary reports, the spreadsheet provides SAIC's estimates for the number of hours per review. For other items (summary of CMOM management program, system evaluation and capacity assurance plan, and CMOM program audit), SAIC estimated that the number of hours per review would be one-half of the time it took for municipalities to prepare the item. Since different-sized municipalities require differing amounts of time to prepare these items, there is no single number of hours per review to apply to each item reviewed. Therefore, the average number of hours per review was calculated in this Economic Analysis based on the total number of items to review and the total number of hours presented in SAIC's spreadsheet.

Table 5-8: State and Federal costs attributable to the proposed rule

	Review summary of CMOM mgt program	**Review overflow response plan**	**Review system evaluation and capacity assurance plan**	**Review CMOM program audit**	**Receive, process and review annual SSO summary report to the public**	**Satellite systems: Review full permit applications**	**Satellite systems: Review notices of intent (NOIs) under general permit**	**Totals**
How many systems submit?	All systems (19040)	All systems (19040)	33% of all systems (6283)	All systems (19040)	All systems (19040)	10% of all satellites (474)	90% of all satellites (4267)	
How often?	Every 5 yrs	Every 5 yrs	Every 5 yrs	Every 5 yrs	Every year	Once	Once	
% of submitted items that are reviewed	5%	5%	5%	5%	100%	100%	100%	
# of hours per review	20.2	4	8	21	0.5	2	0.25	
Total hours to perform these reviews one time	19,230.4	3,808.0	2,513.3	19,992.0	9,520.0	948.2	1,066.7	57,078.6
State hours	14,999.7	2,970.2	1,960.4	15,593.8	7,425.6	739.6	832.0	**44,521.3**
Federal hours	4,230.7	837.8	552	4,398.2	2094.4	208.6	234.7	**12,557.3**
Annualized State costs reflecting implementation timing assumptions	$67,620	$16,080	$8,138	$69,554	$207,917	$1,152	$1,296	**$371,756**
Annualized Federal costs reflecting implementation timing assumptions	$21,783	$5,180	$2,621	$22,406	$66,979	$371	$417	**$119,759**

	Review summary of CMOM mgt program	**Review overflow response plan**	**Review system evaluation and capacity assurance plan**	**Review CMOM program audit**	**Receive, process and review annual SSO summary report to the public**	**Satellite systems: Review full permit applications**	**Satell e systen : Revie notice of inten (NOI under genera permi**
Total annualized oversight authority costs reflecting implementation timing assumptions	$89,403	$21,260	$10,759	$91,961	$274,896	$1,523	$1,71

6. BENEFITS OF THE PROPOSED REGULATION

6.1 SSO-Reduction and Water-Quality Benefits of the Proposed Rule

The proposed SSO rule adds many new administrative and procedural requirements, and clarifies many other existing requirements. The proposed provisions are aimed at making it more certain that the existing prohibition on unauthorized discharges, specifically SSOs, will be achieved by all collection systems in the United States. This prohibition on SSOs is not new, and there is nothing in the proposed regulations that alters, loosens, or tightens it. Instead, the rule prescribes a much strengthened set of managerial requirements for collection systems relating to SSOs, including provisions addressing planning, priority-setting, data collection and management, reporting, response, and other activities. These requirements are intended to help ensure that collection systems implement appropriate measures for achieving the existing standard of no unauthorized SSOs. The planning measures in the proposed rule are designed to cost-effectively and proactively prevent violations of the existing standard. Proposed provisions addressing reporting and public notice assure mitigation of potential public health impacts, while provisions addressing record-keeping assure that the necessary decision-making can be supported by good data, and that continuity can be maintained within the sewer management office.

The proposed SSO regulation differs from other rulemakings in that the relevant regulatory standard (no unauthorized discharge) and the management and administrative requirements necessary to achieve the standard have not been established simultaneously. In the more typical situation triggering an Economic Analysis (EA), both the standard and the supporting administrative requirements are established simultaneously, and the EA assesses the benefits and costs of the entire package. In such cases, benefits are considered to arise from compliance with the combination of the regulatory standard and the administrative requirements needed to implement the standard.

For SSOs, however, the regulatory standard (no unauthorized discharge) that drives control and prevention costs has already been established. The existing requirement for no unauthorized SSOs means that systems need to invest in expansion, rehabilitation and I/I control to assure adequate capacity, and to enhance their O&M programs. As discussed in Section 3 on the need for the proposed regulation, however, current performance for many collection systems falls short of this existing standard of no unauthorized discharges. The administrative elements of the Nation's programs for managing collection systems need to be strengthened so that this standard is achieved more assuredly, promptly, efficiently and universally.

In the view of both EPA and the stakeholders in the SSO FAC process, both sorts of spending -- the "bricks and mortar" spending by collection systems on increased capacity and intensified O&M and the administrative spending on strengthened management -- are necessary in order to achieve the standard.

Neither sort of spending alone will be effective.

In economists' terms, this situation is an example of joint costs. Two activities together are needed to produce an output or a set of benefits. The output or benefits cannot be produced if one of the jointly necessary inputs is missing. In such a situation, there is no analytically correct way to allocate separate shares of the output or benefits to one or the other of the inputs. Often, though, when there is some need to allocate output or benefits among the joint inputs, analysts develop an allocation based on the relative costs of the inputs.[64] If the first input accounts for 3/4 of the total costs of the production process, for example, then 3/4 of the output or benefits or revenues are attributed to the first input.

This proportional allocation approach has been adopted in order to estimate the SSO-reduction and water-quality benefits of the SSO proposal. The quantified benefits of eliminating SSOs have been estimated in the Benefits Report as $ 1.07 - $ 6.1 billion annually. However, $1.0 - $5.5 billion of those benefits may be attributed to improved water quality and reduction of SSOs. The annualized costs of investments by collection systems in increased capacity and intensified O & M that are needed to achieve virtually no SSOs are estimated in the Needs Report as $ 6.8 - $ 9.8 billion per year.[65] The incremental costs of this proposed rule, which EPA judges as also necessary to achieve this standard, total $ 93.5 - $ 126.6 million annually. The proposed rule thus accounts for 1.3 to 1.4 % of the total costs needed to achieve the standard. If a similar share of the estimated $ 1.0 - $ 5.5 billion in quantified water quality and SSO abatement benefits is allocated to this rule, the estimated benefits attributable to this rule alone are $ 12 million - $ 74 million annually.

6.1.1 Description of SSO-reduction, water quality and other benefits

The separate Benefits Report, which considers the wide range of benefits associated with achieving no unauthorized SSOs, quantifies (and where possible, monetizes) three principal categories of benefits: water quality-related benefits (for both freshwater and marine water), non-water quality benefits (e.g. reduction in basement backups, avoided SSO response costs), and system benefits (long-term savings in expenditures for operation and maintenance and rehabilitation, repair/replacement that results from increased spending on O&M to meet SSO objectives).

SSOs can make fresh waters less suitable for productive use, can harm the health of individuals using the waters, and can degrade the ecological communities dependent on the waters. If SSOs were eliminated, thereby improving water quality where SSOs currently contribute to freshwater impairment, more areas could be available for such direct uses as swimming, fishing and boating. In areas where people currently

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[64] See, for example, Anthony and Reece (1979). Accounting. Text and Cases. pp. 540-542.

[65] Estimated costs of capital investments (annualized over 20 years) to achieve roughly 0.2 to 1 overflow per year per system, plus estimated costs of enhanced O&M.

use freshwater resources that are impacted by SSOs, their swimming, fishing or boating experience would be enhanced. Indirect uses near the water, such as picnicking, jogging, walking, sunbathing, and photography, would also be enhanced. In addition, SSO-related water quality improvements would provide non-use, or intrinsic benefits: people derive satisfaction from knowing that other people use fresh water resources, and knowing that the nation's water is cleaner.

The elimination of SSO-related impairment of marine waters would also produce a number of benefits. Enhanced marine water quality would increase the fishable area available to the commercial finfishing and shellfishing industries, and would enhance the productivity of fisheries, leading to larger catches. It would also increase the fishable area available to people who enjoy marine recreational fishing. Beach closures and shellfish bed closures resulting from SSOs would be avoided, as would illnesses among people who swim in marine waters and who eat shellfish. Water quality improvements would also lead to increased wildlife viewing along the coast. In addition to use-related benefits, there are intrinsic, or non-use benefits associated with the satisfaction people derive from knowing that marine waters are clean and that others can use them.

Other benefits from abating SSOs do not depend on improved ambient water quality. Fewer SSOs in the form of basement backups will lead to reduced property damage, cleanup costs, homeowner irritation and potential health risks. Another set of costs that would be avoided is response costs incurred by wastewater utilities. When SSOs occur, utility staff and equipment are often dispatched to clean up the spill, monitor water quality, and perform other tasks.

System benefits refer to the long-term savings in expenditures for rehabilitation, repair, replacement and O&M that arise from the increased spending on operations and maintenance that the separate Needs Report estimates as necessary to bring all communities into compliance with existing SSO-related requirements. In addition to abating SSOs, this increased spending on O&M (providing for increased frequency of cleaning, inspection, etc.) slows the deterioration of the collection system over time, reduces the number of trouble spots in the system, and extends the life of the system. As a result, expenditures over the long term on rehabilitation, spot repair, replacement, and emergency repair can be expected to decline. These system benefits are not counted in the proportional allocation of benefits to this proposed rule, so as to avoid any possibility of double-counting such benefits with the next category of benefits to be discussed.

6.2 Benefits of the Proposed Rule Relating to Reductions in Total Spending on Collection System Operations

In addition to contributing a proportional share of the benefits from achieving the existing standard, the proposed SSO regulations create another set of benefits -- savings in total spending on collection system operations. The new planning and management program requirements in the proposed rule will ultimately help communities reduce their collection system O&M costs by providing the necessary information and

management approaches to make O&M programs more targeted, efficient, and proactive.[66] This separate set of benefits differs from the SSO-reduction and water-quality benefits discussed in subsection 6.1. Future reductions in operations spending are derived exclusively from the proposed SSO rule, and are obtained independent of the infrastructure spending costed in the Needs Report. Since this further set of benefits is attributed exclusively to the proposed rule, proportional allocation plays no role in its estimation.

The new management, planning and prioritization requirements in the proposed rule will give each community the tools to obtain more and better information on their collection systems than they currently have. Under the proposed rule, each community will undertake the following activities:

- Managing information, and using timely, relevant information to establish and prioritize appropriate CMOM activities;
- Monitoring and measuring the effectiveness of the capacity, management, operation and maintenance program;
- Identifying, evaluating and reporting trends in overflows;
- Including legal authority to ensure proper installation, testing, and inspection of new and rehabilitated sewers;
- Establishing procedures and specifications for design, inspection and testing installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects;
- Evaluating parts of the system with hydraulic deficiencies and identifying components that limit overall capacity;
- Prioritizing structural deficiencies, and identifying short-term and long-term rehabilitation actions to address each deficiency;

This information, in turn, will be used to create a "smarter" O&M program -- one that more effectively targets problem areas, prioritizes tasks, and anticipates future problems.

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[66] The new planning and management program requirements will also help communities make more cost-effective decisions on collection system capacity issues as well as O&M issues. Long-term savings can be expected on system capital costs, and the avoidance of excess system capacity can be expected in turn to reduce future O&M costs. However, these likely impacts of the rule on collection system capital costs and associated O&M costs have not been quantified in this analysis.

In estimating the benefits of "smarter" O&M , it is not assumed that the proposed rule will make communities spend more money than they presently are on O&M. Rather, existing O&M programs and spending will be refocused and redirected as a result of the new planning and management requirements in the proposed rule. The rule will refocus and redirect these O&M programs that are assumed to be part of the baseline, producing benefits in the form of savings in the costs of the assumed baseline O&M programs.

Current spending on O&M is directed to the following activities, among others:[67]

- Cleaning to remove deposits that reduce the effective capacity of parts of the collection system;
- Inspection of the collection system to identify infiltration and inflow sources and structural defects;
- Removal of roots, which cause blockages;
- Testing and repair of joints to reduce infiltration; and
- Inspection and repair of manholes to reduce infiltration and inflow.

It is estimated that communities currently spend $1.6 billion on these activities.[68] As also discussed in the Needs Report, additional spending on O&M -- beyond current spending levels -- is needed to achieve existing CWA and NPDES requirements. The Needs Report estimates that approximately $1.5 billion annually in additional O&M spending will be needed in order for all communities to comply with existing requirements. Current O&M spending, as well as the additional O&M spending required to meet existing requirements, are part of the baseline. These costs are independent of the costs of the proposed rule, which does not require additional O&M, but rather redirects existing O&M programs to optimize their efficiency and effectiveness.

6.2.1 Approach to estimating the benefits of "smarter" O&M

The Water Environment Research Foundation's (WERF) 1997 benchmarking report[69] -- which is

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[67] Parsons Engineering Science, Inc., Metcalf and Eddy, and Limno-Tech, Inc. (2000). *Sanitary Sewer Overflow (SSO) Needs Report*. Prepared for U.S. EPA, Office of Water, Office of Wastewater Management. Contract No. 68-C6-0001. Draft, March, 2000.

[68] Ibid. Section 4.6.2 and Appendix H.

[69] Water Environment Research Foundation (WERF), 1997. *Benchmarking Wastewater Operations: Collection, Treatment, and Biosolids Management.* Final Report, Project 96-CTS-5.

perhaps the most comprehensive collection system benchmarking study to date -- analyzed performance data across numerous collection systems, and developed a statistical relationship "explaining" how much money a system spends on total operating costs. WERF's regression equation explains over 68% of the variance in total system operating costs across 60 wastewater collection systems that responded to a WERF survey. Using one of the variables in the WERF regression, this analysis estimates the average percentage change in total operating costs associated with "smarter" O&M.

For the purpose of this analysis, it is assumed that relationships in WERF's regression equation can be used to estimate the operating cost impact of smarter O&M for all collection systems, despite WERF's survey respondents consisting primarily of larger systems. The average system responding to WERF's survey managed approximately 1,000 miles of sewers. A system of 1,000 miles of sewer serves about 300,000 people (18 feet of pipe length per capita -- ASCE, 1998). The 1996 EPA Needs Survey reports that 99% of all sanitary sewer systems in the U.S. serve less than 100,000 people (U.S. EPA, 1998). Therefore, the systems responding to the WERF survey were, on average, much larger than most of the collection system in the U.S.

The preferred WERF model takes the following form:[70]

$$OPCSTCOL = e^{0.898} \times (MILES^{0.539}) \times [(PCINSP/100)+1]^{-0.084} \times (PUMP+1)^{0.285} \times (COLWAGE^{0.897}) \times (100 \times KWH)^{0.15}$$

The variables are defined as follows:

OPCSTCOL	=	Total cost of collection operations, excluding depreciation ($)
MILES	=	Miles of sewers
PCINSP	=	Percentage of sewers inspected each year
PUMP	=	Number of pumping stations
COLWAGE	=	Average annual wage of a collection worker ($)
KWH	=	Cost per kWh of electricity (cents)

The regression equation indicates that as a system increases the percentage of its system miles inspected annually, other things being equal, the system's total operating costs (which reflect costs of operation and maintenance) will decrease. The benchmarking study explains that

> [t]his variable [percentage of sewers inspected each year (PCINSP)] is an indicator of routine maintenance procedures. Utilities with greater inspection efforts can be expected

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Alexandria, VA.

[70] WERF, 1997, p. 11-4.

> to spend more monies on preventative maintenance, but they might save on emergency response, to the extent that their inspections avert emergencies. This variable may have an overall negative impact on operating expenses, if the inspections are cost effective[71].

Following WERF's interpretation, this analysis assumes that the percentage of sewers inspected is an indicator of the types of activities which are emphasized in a community's O&M program. As noted by WERF, utilities which inspect a larger portion of their system can be expected to perform more preventative maintenance than those which inspect a relatively smaller portion of their system. Such utilities devote more resources up-front to preventative maintenance (PM) based on the understanding that, over time, PM is much less expensive than the pipe failures and emergency responses which PM helps minimize. Given the proactive and forward-thinking approach taken by such utilities, it can be expected that they manage their O&M programs in a manner designed to maximize efficiency and cost-effectiveness. In short, such utilities can be expected to conduct what this analysis refers to as "smart" O&M programs -- programs that are more effective in targeting problem areas, prioritizing tasks, and anticipating future problems. In this analysis, it is assumed that the percentage of sewers inspected each year by a utility is a proxy for the extent to which a system has a smart O&M program.

As discussed above, the proposed rule will help create "smarter" O&M programs by requiring that they prioritize their activities and obtain information that will be used to make existing O&M programs more proactive, efficient, and cost-effective. As a result of the proposed rule, many communities will shift existing O&M program resources into such activities as preventive maintenance and system inspection. It should be noted that such a redirection and refocusing of O&M programs does not entail an increase in spending, but rather a shift in emphasis towards more cost-effective activities.

In order to estimate savings on total collection system operating costs resulting from "smarter" O&M, it is first necessary to estimate the increase in the percentage of sewers inspected each year that would occur under a "smarter" O&M program. That increase is then applied in WERF's regression equation to predict the effect on operating costs.

The report notes that the average wastewater collection system in the sample inspects 6.5% of sewers annually. The minimum value for the percentage of sewers inspected in the sample is 0%, and the maximum value is 47.5%. For the purpose of this analysis, it is assumed that the average collection system in the U.S. currently inspects the same percentage of its sewers each year as the mean collection system in the WERF sample -- 6.5%. It is further assumed that collection systems undertaking a "smarter" O&M program as prompted by the proposed regulation will, on average, inspect the same percentage of its sewers each year as the 90th percentile collection system in the WERF sample -- 16.8%.[72] Therefore, collection

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[71] Ibid., p. 11-3.

[72] Supporting data provided by WERF, April 1999 (WERF, 1999).

systems that implement a "smarter" O&M program would, on average, increase the amount of sewers that they inspect each year by 10.3 percentage points.

Using the WERF regression equation, the change in total collection system operating cost associated with a change in the percentage of sewer miles inspected can be predicted. When the percentage of sewer miles inspected increases from 6.5% to 16.8%, total collection system operating costs would be expected to decrease by 0.77%.

Applying this projected 0.77 % savings to estimated baseline total national O&M spending of $3.1 billion/year ($1.6 billion currently being spent, plus $1.5 billion additional to meet SSO abatement needs), the benefits associated with the proposed rule's role in creating "smarter" O&M programs are estimated at $23.9 million per year.

6.3 Summary of Estimated Benefits

As indicated in Table 6-1, the total monetized benefits of the proposed SSO rule are estimated at $36.1 million to $97.8 million annually. Additional benefits can be expected that have not been monetized. The Benefits Report discusses a wide variety of non-monetized benefits from the water quality improvements expected with fewer SSOs. "Smarter" O&M programs will result in savings in O&M costs as quantified, but will also result over the longer term in improved capacity planning and unquantified opportunities for savings in capital investments. Furthermore, as EPA assists in disseminating information on innovative, highly efficient management strategies that are developed in particular communities, the savings from smarter O&M will increase in the future as more communities adopt these successful strategies.

Table 6-1: Monetized benefits of the proposed SSO rule

Benefits category	Estimated annual monetized benefits	
	lower estimate	upper estimate
Benefits of fewer SSOs and improved water quality	$ 12,200,000	$ 73,900,000
Savings from "smarter" O&M programs	$ 23,900,000	$23,900,000
TOTAL	**$ 36,100,000**	**$ 97,8000,000**

6.4 Comparison of Benefits and Costs

The estimated costs of the proposed rule are $93 - $127 million annually. The estimated monetized

benefits range from $36 - $98 million annually. These monetized benefits thus appear to be of the same general order of magnitude as the costs of the rule. In addition, EPA was not able to monetize several important sorts of benefits.

Table 6-2: Comparison of benefits and costs of the proposed SSO rule

Benefits of the rule: monetized non-monetized	$ 36,000,000 to $ 98,000,000 per year xxx
Costs of the rule	$ 93,000,000 to $ 127,000,000 per year

This quantitative comparison of the rule's estimated costs and benefits provides analytical support for the proposed rule.

7. ANALYSIS OF ALTERNATIVES

In addressing sanitary sewer overflows and proper management, operation and maintenance of collection systems, EPA considered a number of alternative approaches. This section discusses the various alternatives considered by EPA, and explains why the alternative embodied in the proposed rule was selected rather than the other alternatives.

Over several years of discussions with stakeholders, numerous meetings of the SSO Subcommittee of the Wet Weather Flows Federal Advisory Committee, and many draft analyses and discussion papers that have been circulated among experts and the public at large, a wide range of alternatives have been brought to EPA's attention. These alternatives have presented different approaches to meeting the objectives of this rulemaking -- reducing SSO-related health and environmental risks, and protecting the nation's major investments in sanitary sewer collection system infrastructure. Some of the most important alternatives that EPA has considered are the following:

C A more prescriptive approach regarding proper capacity, management, operation and maintenance (CMOM) for sanitary sewer collection systems, which adopts a single standard for each element.

C Extending the requirements of the proposed rule to privately owned satellite sanitary sewer collection systems. The proposed rule applies only to municipal satellite systems.

C No regulation.

C The proposed regulation.

The following is a detailed description of the alternatives.

<u>Alternative #1: Adopting a more prescriptive approach regarding proper capacity, management, operation and maintenance</u>

EPA considered specifying in more detail the standards that a system's capacity, management, operation and maintenance (CMOM) program must meet in order to be acceptable. Under this approach, several additional requirements beyond those in the proposed regulation were included. Under this alternative, sanitary sewer collection systems would additionally be required to:

- Maintain an electronic Information Management System to support other data-intensive CMOM requirements; and

- Conduct treatment plant optimization and reflect those results in the Management Plan.

Also, all communities, not just those subject to SSOs, would be required to establish a System Evaluation and Capacity Assurance plan, analyzing alternatives, establishing priorities, setting forth the chosen capacity enhancement actions, and providing a schedule for implementation. Additionally, under this more prescriptive alternative, the development of the CMOM Management Program Summary and the CMOM audit would be required of *all* communities. Under the proposed rule, those communities under 25,000 population without SSOs are not subject to the requirements for a Program Summary or Audit.

The cost of the Alternative #1 was estimated at $278 - $375 million annually. This compares with an estimated cost for EPA's chosen alternative of $93 - $127 million annually. The largest portion of the increased cost of Alternative #1 is associated with the required electronic information management systems.

EPA rejected the prescriptive, "one size fits all" approach, because the flexibility afforded by the preferred option (the proposed regulations) was appropriate. Formal information management systems are entirely appropriate for larger, more complex collection systems (most, in fact, already have them), but may not be necessary for much smaller systems. Tailoring the CMOM requirements based on system size and performance regarding SSOs, as the preferred option does, is cost-effective. Collection systems of different ages and construction materials, in different climatological zones, for example, quite reasonably call for different sorts of CMOM programs -- EPA believed that it was reasonable to trust oversight authorities and allow them some discretion to modify several CMOM requirements to fit the circumstances of specific collection systems. EPA decided that it was important to list the sorts of elements that need to be addressed in an adequate CMOM program, but that specifying exactly how or the degree to which each of the elements must be implemented would be unwise and not cost-effective. The chosen alternative encourages a collection system to work with its oversight authority to develop a CMOM program that addresses all of the required elements, but in a manner that is "appropriate and applicable" considering the system's particular circumstances and needs.

<u>Alternative #2: Extending the requirements of the proposed rule to privately owned satellite sanitary sewer collection systems</u>

The proposed rule would apply to an estimated 4,741 municipal satellite collection systems. There are, however, a large number of additional privately owned satellite systems throughout the Nation that can have capacity or operations and maintenance problems and either experience SSOs themselves or contribute excessive peak flows to a regional collection system that in turn may experience SSOs. EPA considered subjecting these <u>privately owned</u> satellite systems to the same requirements as are proposed for <u>municipal</u> satellite collection systems (permitting, reporting, record-keeping, notification, CMOM, etc.).

Privately owned satellite collection systems are currently regulated insofar as unauthorized discharges to waters of the U.S. from them or any other point source are prohibited. In addition, EPA's chosen alternative will add further protection from discharges from privately owned satellite systems. The proposed

regulation will require POTWs and municipal sanitary sewer collection systems to have legal authority sufficient to implement their CMOM program, specifically including the authority to control infiltration and connections from inflow sources. It is expected that a POTW or municipal sanitary sewer collection system will conclude a service agreement with any satellite collection system, public or private, that discharges to the municipal system, and that the service agreement will require the satellite system to appropriately manage its inflows to the municipal system. The POTW or municipal sanitary sewer collection system will be required by the proposed regulation to have adequate legal authority to address inflows from the satellite system. The proposed regulation establishes no duties for the privately owned satellite collection system, but the regulation does require the POTW or municipal system to have authority to act to resolve the problem if inflows from the satellite system cause problems.

As an alternative to this approach, EPA considered subjecting privately owned satellite collection systems to the full set of requirements under the propose rule. EPA estimates the cost of this alternative at roughly $411 million to $1.1 billion annually. This cost is estimated as follows.

There is very little information on the number of privately owned satellite collection systems that exist. Such systems can be associated with trailer parks, some residential subdivisions, apartment complexes, commercial complexes such as shopping centers, campus-style office developments, resort developments, industrial parks, and colleges and universities. Not all of these entities, however, involve privately owned satellite collection systems. For many of them, the collection system is publicly owned (e.g., collector sewers in most residential subdivisions are publicly owned). And, for many of them, the collection system may be privately owned but the flows are eventually treated by a privately owned treatment plant rather than a POTW, and hence they are outside the scope of this rule. The Association of State and Interstate Water Pollution Control Administrators estimates that about 25,000 NPDES permits have been issued for privately owned treatment plants.

It is estimated that there may be about 120,000 to 260,000 private entities that may own satellite collection systems.[76] Most of these private satellite collection systems are much smaller than the average

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[76] This figure includes:

A) 1,533 private colleges and universities. (Source: Collegenews/Schiff index of public and private colleges and universities in the U.S.)

B) 50,000 manufactured housing communities. Of these, roughly 85 % are sewered, and 85 % of them manage their own collection system. This yields a potential for 36,125 privately owned collection systems. (Source: Jim Ayott, Manufactured Housing Institute, 3/24/2000.)

C) No data are available on the number of residential, commercial, office, industrial, and resort complexes that are large enough to have collection systems (as opposed to building laterals) and that own these

municipal collection system, and they likely on average serve fewer than 500 people. EPA estimates that a typical privately owned satellite system might have costs of complying with the proposed rule provisions somewhat lower than the compliance cost for a typical very small municipal collection system. Small municipal systems (< 10,000 people per system) are estimated to incur annualized compliance costs under the proposed rule of $2,646 - $3,947 per year. The compliance costs for regulating both private and muncipal satellite sanitary sewer collection systems is estimated as $411 million to $1.1 billion annually. In addition, if privately owned satellite systems were to be regulated, there would be a substantially greater burden for oversight authorities resulting from an increase in processing permits from a universe of 19,500 collection systems to 140,000 or more.

EPA rejected this alternative. Full regulation of privately owned satellite collection systems would add sharply to the cost of the proposed rule for little additional benefit. Privately owned satellites are already subject to enforcement action if they have SSOs to waters of the U.S. The proposed rule provides additionally for regulation of flows from privately owned satellite systems in a manner that will probably address most of the problems they may cause in terms of contributing excessive peak flows to publicly owned regional collection systems.

Alternative #3: BAT/BCT Approach

EPA considered the option of changing its interpretation that secondary treatment is the appropriate technology-based standard for discharges from municipal sanitary sewer collection systems. Under this alternative, EPA would change its existing interpretation to apply best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT) as the technology-based

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systems themselves. Relatively few of such complexes are expected to be in urban centers, since collection systems tend to be privately owned only when they are developed by a private entity in an area that lacks existing municipal sewerage. As a very rough figure, it is estimated that there may be 5 to 10 such complexes on average per 5,000 population living outside of urban centers. Approximately 55 % of the U.S. population of 271 million lives in cities of 50,000 or more, leaving about 122 million people living outside of these areas. (Source: Statistical Abstract) The result is an estimated 122,000 - 244,000 complexes that may have privately owned collection systems.

D) Summing private colleges, manufactured housing communities and these complexes gives an estimated 160,000 - 280,000 privately owned collection systems.

E) From all these estimated privately owned collection systems, there must be subtracted the systems that discharge to the 25,000 privately owned treatment plants. It is estimated that there may be 1 - 1.5 collection systems on average associated with each of these treatment plants, so 25,000 - 37,500 privately owned collection systems should be deducted from the previous total. The result is a range of approximately 120,000 - 260,000 privately owned collection systems that are satellites of POTWs.

standard for authorizing discharges from sanitary sewer collection systems. Under this alternative, the Agency would still promulgate standard permit conditions that are similar to the CMOM program, prohibition, and reporting, record keeping and public notification standard permit conditions being proposed. These standard permit conditions could provide a framework for permitting authorities to determine the technology-based and water quality-based requirements needed to comply with the CWA. Changing to the BAT/BCT standard would provide NPDES authorities with more flexibility to authorize discharges from peak excess flow treatment facilities (PEFTFs) serving sanitary sewer collection systems. Under this alternative, effluent limitations in permits for discharges from PEFTFs would need to include effluent limitations based on BAT/BCT and any more stringent limitations necessary to meet water quality standards.

EPA has developed estimates of the costs of an alternative control scheme that allows for authorizing treated discharges from municipal sanitary sewer systems in limited cases (see section 5.2.2. of *draft SSO Needs Report*, EPA, 2000). In developing these costs, EPA assumed that PEFTFs would be used by the three percent of municipalities (with collection systems serving 5,000 or more) with the highest per capita costs of SSO abatement. EPA assumed that these systems would pursue SSO abatement measures to reach an objective of no more than 5 SSOs/system/year, and that PEFTFs would be developed to treat the effluent discharged during these five events per year. This alternative control scenario can be used as a surrogate for the BAT/BCT approach. The BAT/BCT was estimated to save these 109 systems roughly $1.3 billion over 20 years relative to the costs these systems would incur to meet an objective of one SSO/year through increased system capacity, I/I control and enhanced O&M. On an annualized basis, this cost savings is equivalent to $ 126 million/year.

While this alternative would save money relative to EPA's existing interpretation of CWA requirements, it would also result in many (more than 500 per year, under these assumptions) additional discharges of effluent treated to less than secondary standards to waters of the U.S. EPA believes the degradation of water quality that would result from these discharges is inconsistent with the goals of the CWA, and the Agency rejected this alternative.

Alternative #4: No regulation

EPA considered a "no regulation" option. This option would obviously be much less costly to municipal sanitary sewer collection systems than would EPA's chosen alternative. However, in EPA's estimation, the "no regulation" option would not be consistent with the requirements of the Clean Water Act. The CWA prohibits unauthorized discharges (including SSOs) to waters of the U.S. Despite this prohibition, numerous unauthorized SSOs currently occur, as a result largely of inadequate capacity, operation, maintenance and management of municipal sanitary sewer collection systems. SSOs currently cause (as estimated in the Benefits Report) $1.0 - $5.5 billion annually in monetized damages, and most of these SSOs are preventable. The "no regulation" option would leave this situation unchanged. The "no regulation" option would also leave unchanged the varying interpretations of current SSO requirements that

now prevail across different communities and oversight authorities.

The "no regulation" option would not contribute toward EPA's dual objectives of reducing SSO-related health and environmental risks and protecting the nation's major investments in sanitary sewer collection system infrastructure. There is a need for both clarification of existing requirements and targeted new requirements in the areas of record keeping, reporting and public notification; capacity, management, operation and maintenance; the general prohibition on SSOs; and municipal satellite collection systems. The "no regulation" option would be inconsistent with substantial stakeholder input and with EPA's determination that current shortcomings in collection system performance require strengthened regulatory oversight.

Alternative #5: The proposed regulation -- the selected alternative

EPA's decisions regarding which approaches to take in the proposed rule have been substantially influenced by stakeholder input, much of which has reflected consensus views. The proposed rule incorporates a strategy for ensuring adequate collection system capacity that is flexible and system-specific; assuring that all necessary and relevant information is developed and evaluated and that current industry standards are met; and recognizing as a practical matter that some SSOs are unavoidable. The proposed rule reflects EPA's decision that a prescriptive CMOM program specifying exactly how each element must be implemented would be unnecessarily rigid and not cost-ineffective. The proposed rule for municipal sanitary sewer collection systems requires a thorough but flexible program including record keeping, reporting and public notification; capacity, management, operation and maintenance. These requirements are not extended to privately owned satellite collection systems. Full regulation of the vast number of private satellite systems would be very costly and would produce little additional benefit beyond that achievable with the combination of the existing CWA prohibition and indirect influence on private satellite systems through service agreements with regional collection systems.

In sum, it was concluded that the other potential alternative approaches for achieving the objectives of reducing SSO-related health and environmental risks, and protecting the nation's major investments in sanitary sewer collection system infrastructure, are either more costly, more burdensome, less cost-effective or insufficiently environmentally protective relative to EPA's chosen alternative.

Summary Comparison of Alternatives

Table 7-1 provides a summary comparison of the major alternatives.

Table 7-1: Summary comparison of alternatives

Alternative	Costs (million $/yr)	Benefits (million $/yr)
Alternative #1	278 - 375	Very slightly more than Alt. #4
Alternative #2	411 - 1,156	Very slightly more than Alt. #4
Alternative #3	Savings of 126	Negative (not quantified)
Alternative #4	None	None (does not achieve goals of CWA)
Alternative #5: Selected	93 - 127	36 - 98

Unfunded Mandates

Title II of the Unfunded Mandates Reform Act of 1995 (Public Law 04-4; UMRA) establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local and tribal governments as well as the private sector. Under section 202(a)(1)n of UMRA, EPA must generally prepare a written statement, including a cost-benefit analysis, for proposed and final regulations that "includes any Federal mandate that may result in the expenditure by States, local, and tribal governments, in the aggregate or by the private sector" of annual costs in excess of $100 million. As a general matter, a federal mandate includes Federal Regulations that impose enforceable duties on State, local and tribal governments, or on the private sector (Katzen, 1995). Significant regulatory actions require Office of Management and Budget review and the preparation of a Regulatory Impact Assessment that compares the costs and benefits of the action.

The SSO Proposal is anticipated to cost the public sector more than $100 million/year for the time period analyzed. In particular, the Economic Analysis (EA) addresses:

< Section 202(a)(1) - authoring statute and legislation (See EA Chapter 2 and the Preamble to the rule)

< Section 202(a)(2) - a qualitative and quantitative assessment of the anticipated costs and benefits of the regulation (See EA chapters 4 - 6 and accompanying appendices)

< Section 202(a)(3)(A) - accurate estimates of future compliance costs (as reasonably feasible; see EA chapter 5)

< Section 202(a)(3)(B) - disproportionate effects on particular segments of the private sector or local communities (see EA Chapter 8)

< Section 205(a) - least burdensome option or explanation required (see Chapter 7 and Preamble to the Rule)

Pursuant to UMRA section 203, before an agency establishes any regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments, it must have developed a small governments agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements. The Preamble to the proposed rule summarizes the extent of EPA's consultation with stakeholders including industry, environmental groups, States, local and Tribal governments.

Pursuant to section 205(a)(1)-(2), EPA has selected the "least costly, most cost-effective or least burdensome alternative" consistent with the requirements of the CWA for reasons discussed in the Preamble of the rule. A cost comparison shows that two alternative options (Alternative #1 costing $278 - 375 million/yr and Alternative #2 costing $411 million - $1.16 billion/yr) are substantially more costly than the $93 - 127 million estimated for the selected alternative. Two other alternatives (#3 and #4) do not achieve the goals of the Clean Water Act.

Under the CWA sections 304(i), 308, and 402(a), EPA is proposing standard permit conditions that were developed from existing standard permit conditions to specifically address municipal systems and discharges. This rule addresses municipal sanitary sewer collection systems and SSOs.

8. ADDITIONAL ANALYSES

Federal rulemaking is subject to administrative requirements with regard to possible impacts of the rule on small entities and Tribes. Potential impacts in these areas are often estimated and assessed as part of the economic analysis supporting the rule.

8.1 Impacts on Small Entities

The Regulatory Flexibility Act generally requires the EPA to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

To determine the applicability of these analytical requirements, the Agency first screened its proposed rule to determine what economic impacts, if any, the rule will have on small entities. The proposed SSO rule would affect only governmental entities. Specifically, the proposed rule would (i) prescribe new requirements for EPA and EPA-authorized state National Pollutant Discharge Elimination System (NPDES) programs; and (ii) prescribe new permit conditions for municipalities with NPDES permits for discharges from publicly owned treatment works (POTWs). Under the Regulatory Flexibility Act (RFA), a small governmental jurisdiction (hereafter referred to here as a small municipality) is defined as the government of a city, county, town, school district, or special district with a population of less than 50,000.[77] Fully 98 percent of all collection systems, or 18,591 collection systems, are owned by small municipalities as defined by the RFA. Table 8-1[78] provides a breakdown of governmental entities potentially affected by the rule.

[77] 5 U.S.C. § 601(5).

[78] Developed from the 1996 Clean Water Needs Survey Database, Office of Water, U.S. Environmental Protection Agency (1997).

Table 8-1: Total number of municipal collection systems of all sizes potentially affected by the proposed SSO rule

Entity Size	# of Systems	Population Served	% Total Systems	Estimated Miles in Collection System
Municipal Collection Systems				
< 10,000	16,359	29,000,000	86%	98,864
10,000 - 24,999	1,632	25,300,000	9%	86,250
25,000 - 49,999	604	21,100,000	3%	71,932
Total Small Municipalities	18,595	75,400,000	98%	257,046
Large Municipalities (50,000+)	449	72,600,000	2%	247,500
Total Affected Municipalities	**19,044**	**148,000,000**	**100%**	**504,546**

The small entity impact analysis adopts the same assumptions as the Economic Analysis with regard to the baseline -- all potentially affected small entities are assumed to be in full compliance with existing statutory and regulatory requirements, and only the incremental costs of complying with the proposed SSO requirements need to be assessed here. To develop these incremental costs of compliance, a baseline of existing requirements was developed that differentiates current NPDES requirements from the proposed new requirements that would be prescribed by this SSO rule. This analysis also adopts the same determinations regarding whether each proposed provisions is 'new' or 'clarifying' as the Economic Analysis generally (see discussion in subsection 4.2).

The proposed CMOM program would create a flexible regulatory system that allows permittees to implement only those CMOM elements that are appropriate or applicable to their system so long as they provide to EPA a written explanation of their decision. The appropriateness or applicability of a specific CMOM element would depend, for example, on the size of a sanitary sewer system or the extent of capacity-related SSOs. Thus, in calculating the incremental costs of complying with the proposed CMOM requirements, this analysis assumes that smaller systems (49,999 persons served or less) will have the greatest flexibility in deciding not to implement certain CMOM elements. Given that 86 percent of all potentially affected municipal systems consist of the smallest systems (less than 10,000 persons served), the flexibility available to permittees under the proposed SSO rule had a substantial impact on the results of this analysis.

To evaluate the severity of the economic impact of the proposed SSO rule on small municipalities, a "revenue test" was applied. A revenue test calculates the average annual incremental costs of compliance as a percentage of average annual municipal revenues. Based on the financial characteristics of municipalities, compliance costs less than one percent of annual revenue were expected not to have a substantial economic impact on small entities.

Average municipal revenues were calculated by community size using data obtained from the *1992 Census of Governments*. Revenue figures were converted to 1998 by applying a conversion factor calculated from the national income and product account tables of the U.S. Bureau of Economic Analysis.[79] Specifically, the price deflators for 1992 and 1998 were obtained from Table 7.11, *Chain-Type Quantity and Price Indexes for Government*, Line 67, Chain-Type Price Indexes for State and Local Governments. The conversion factor (1.15) was calculated by dividing the price deflator for 1992 (90.21) into the price deflator for 1998 (103.89). Table 8-2 presents average municipal revenues by population size for all states.[80]

[79] Methodology recommended by Bruce E. Baker, State and Local Governments, Government Division, U.S. Bureau of Economic Analysis.

[80]The District of Columbia and Hawaii are not represented in this table because neither entity has a municipality of less than 50,000.

Table 8-2: Average municipal revenues (1998 thousands $) by population size

	Less than 10,000			10,000 to 24,999			25,000 to 49,999		
State	Total Revenue	No. municipalities	Avg. Revenue	Total Revenue	No. municipalities	Avg. Revenue	Total Revenue	No. municipalities	Avg. Revenue
Alabama	$486,238	393	$1,237	$445,066	57	$8,979	$562,624	28	$20,094
Alaska	$1,087,258	152	$7,153	$74,314	2	$37,157	$574,426	4	$143,607
Arizona	$291,226	64	$4,550	$158,429	11	$14,403	$215,722	7	$30,817
Arkansas	$265,683	473	$562	$370,142	54	$6,854	$373,467	22	$16,976
California	$1,062,178	158	$6,723	$1,431,394	94	$15,228	$3,274,625	106	$30,893
Colorado	$575,029	270	$2,130	$440,205	27	$16,304	$244,267	9	$27,141
Connecticut	$800,707	87	$9,204	$2,012,470	53	$37,971	$2,082,417	13	$160,186
Delaware	$43,763	54	$810				$28,067	2	$14,033
Florida	$628,515	277	$2,269	$948,928	73	$12,999	$1,232,192	43	$28,656
Georgia	$585,356	537	$1,090	$881,365	89	$9,903	$787,987	34	$23,176
Idaho	$208,626	210	$993	$143,740	17	$8,455	$163,348	9	$18,150
Illinois	$960,017	1,116	$860	$1,413,360	147	$9,615	$1,476,784	72	$20,511
Indiana	$532,594	509	$1,046	$788,588	66	$11,948	$1,276,765	49	$26,056
Iowa	$728,734	940	$775	$972,983	71	$13,704	$577,251	22	$26,239
Kansas	$664,432	656	$1,013	$439,565	41	$10,721	$383,593	20	$19,180
Kentucky	$409,880	431	$951	$517,652	78	$6,637	$395,327	30	$13,178
Louisiana	$236,631	276	$857	$483,148	41	$11,784	$520,347	17	$30,609
Maine	$971,419	473	$2,054	$489,073	15	$32,605	$169,241	10	$16,924
Maryland	$180,580	137	$1,318	$169,198	13	$13,015	$486,168	12	$40,514
Massachusetts	$1,211,793	190	$6,378	$2,486,535	96	$25,901	$2,557,687	45	$56,837
Michigan	$929,009	453	$2,051	$912,840	68	$13,424	$1,046,400	37	$28,281
Minnesota	$1,076,546	796	$1,352	$1,374,086	83	$16,555	$1,309,327	40	$32,733
Mississippi	$290,498	270	$1,076	$851,864	66	$12,907	$732,131	27	$27,116
Missouri	$632,270	906	$698	$576,129	86	$6,699	$406,887	33	$12,330
Montana	$343,652	155	$2,217	$151,019	16	$9,439	$127,430	4	$31,858
Nebraska	$440,911	587	$751	$181,318	25	$7,253	$133,063	10	$13,306
Nevada	$90,623	18	$5,035	$171,334	6	$28,556	$211,099	4	$52,775
New Hampshire	$389,684	211	$1,847	$219,875	15	$14,658	$408,945	10	$40,894
New Jersey	$1,700,111	344	$4,942	$2,153,587	144	$14,955	$2,171,428	57	$38,095
New Mexico	$172,395	90	$1,916	$175,086	17	$10,299	$261,581	12	$21,798
New York	$1,705,950	1,325	$1,288	$1,393,860	144	$9,680	$1,499,598	60	$24,993
North Carolina	$675,231	474	$1,425	$1,020,257	52	$19,620	$1,897,736	37	$51,290
North Dakota	$176,703	394	$448	$114,143	15	$7,610	$139,103	3	$46,368
Ohio	$887,664	789	$1,125	$1,436,181	112	$12,823	$1,668,415	65	$25,668
Oklahoma	$411,595	567	$726	$401,966	48	$8,374	$457,003	32	$14,281
Oregon	$321,500	213	$1,509	$395,463	30	$13,182	$334,402	12	$27,867
Pennsylvania	$1,440,853	2,371	$608	$834,448	156	$5,349	$675,878	52	$12,998
Rhode Island	$93,800	11	$8,527	$447,505	16	$27,969	$337,581	7	$48,226
South Carolina	$202,231	241	$839	$211,886	30	$7,063	$300,520	21	$14,310
South Dakota	$194,623	349	$558	$144,801	19	$7,621	$16,179	2	$8,090
Tennessee	$716,112	312	$2,295	$1,057,895	57	$18,560	$1,371,342	38	$36,088
Texas	$1,050,394	1,096	$958	$1,405,500	172	$8,172	$1,111,436	68	$16,345
Utah	$174,071	209	$833	$257,779	28	$9,206	$136,600	9	$15,178
Vermont	$259,400	282	$920	$62,114	8	$7,764	$44,863	7	$6,409
Virginia	$498,687	210	$2,375	$1,346,705	56	$24,048	$1,585,402	31	$51,142
Washington	$511,242	233	$2,194	$389,767	27	$14,436	$671,454	22	$30,521
West Virginia	$233,527	226	$1,033	$193,028	26	$7,424	$304,304	22	$13,832
Wisconsin	$797,887	527	$1,514	$735,402	60	$12,257	$886,859	32	$27,714
Wyoming	$182,159	97	$1,878	$222,899	14	$15,921	$257,047	6	$42,841

Table 8-3 summarizes the average annual incremental costs of compliance for small municipalities developed in the Economic Analysis for the proposed SSO rule.

Table 8-3: Average annual costs by community size

Municipality Size	Number of Communities	Average Annual Costs (lower estimate)	Average Annual Costs (upper estimate)
< 10,000	16,359	$2,646	$3,947
10,000 - 24,999	1,632	$10,313	$14,332
25,000 - 49,999	604	$15,182	$17,399

Based on the analysis of municipal revenues and the results of the revenue test, the proposed SSO rule is not projected to have a significant economic impact on a substantial number of small municipalities. Even the smallest municipalities, those with populations of less than 10,000, would incur compliance costs well below one percent of annual revenue. Table 8-4 summarizes the revenue test by population size.

Table 8-4: Revenue test by population size (1998 thousands $)

	< 10,000			10,000 - 24,999			25,000 - 49,999		
State	Avg Revenue	Avg. Economic Impact (low estimate)	Avg. Economic Impact (high estimate)	Avg. Revenue	Avg. Economic Impact (low estimate)	Avg. Economic Impact (high estimate)	Avg. Revenue	Avg. Economic Impact (low estimate)	Avg. Economic Impact (high estimate)
Alabama	$1,237	0.21%	0.32%	$10,912	0.09%	0.13%	$26,470	0.06%	0.07%
Alaska	$7,153	0.04%	0.06%	$37,157	0.03%	0.04%	$143,607	0.01%	0.01%
Arizona	$4,550	0.06%	0.09%	$14,403	0.07%	0.10%	$30,817	0.05%	0.06%
Arkansas	$562	0.47%	0.70%	$6,854	0.15%	0.21%	$16,976	0.09%	0.10%
California	$6,723	0.04%	0.06%	$15,228	0.07%	0.09%	$30,893	0.05%	0.06%
Colorado	$2,130	0.12%	0.19%	$16,304	0.06%	0.09%	$27,141	0.06%	0.06%
Connecticut	$9,204	0.03%	0.04%	$37,971	0.03%	0.04%	$160,186	0.01%	0.01%
Delaware	$810	0.33%	0.49%				$14,033	0.11%	0.12%
Florida	$2,269	0.12%	0.17%	$12,999	0.08%	0.11%	$28,656	0.05%	0.06%
Georgia	$1,090	0.24%	0.36%	$9,903	0.10%	0.14%	$23,176	0.07%	0.08%
Idaho	$993	0.27%	0.40%	$8,455	0.12%	0.17%	$18,150	0.08%	0.10%
Illinois	$860	0.31%	0.46%	$9,615	0.11%	0.15%	$20,511	0.07%	0.08%
Indiana	$1,046	0.25%	0.38%	$11,948	0.09%	0.12%	$26,056	0.06%	0.07%
Iowa	$775	0.34%	0.51%	$13,704	0.08%	0.10%	$26,239	0.06%	0.07%
Kansas	$1,013	0.26%	0.39%	$10,721	0.10%	0.13%	$19,180	0.08%	0.09%
Kentucky	$951	0.28%	0.42%	$6,637	0.16%	0.22%	$13,178	0.12%	0.13%
Louisiana	$857	0.31%	0.46%	$11,784	0.09%	0.12%	$30,609	0.05%	0.06%
Maine	$2,054	0.13%	0.19%	$32,605	0.03%	0.04%	$16,924	0.09%	0.10%
Maryland	$1,318	0.20%	0.30%	$13,015	0.08%	0.11%	$40,514	0.04%	0.04%
Massachusetts	$6,378	0.04%	0.06%	$25,901	0.04%	0.06%	$56,837	0.03%	0.03%
Michigan	$2,051	0.13%	0.19%	$13,424	0.08%	0.11%	$28,281	0.05%	0.06%
Minnesota	$1,352	0.20%	0.29%	$16,555	0.06%	0.09%	$32,733	0.05%	0.05%
Mississippi	$1,076	0.25%	0.37%	$12,907	0.08%	0.11%	$27,116	0.06%	0.06%
Missouri	$698	0.38%	0.57%	$6,699	0.15%	0.21%	$12,330	0.12%	0.14%
Montana	$2,217	0.12%	0.18%	$9,439	0.11%	0.15%	$31,858	0.05%	0.05%
Nebraska	$751	0.35%	0.53%	$7,253	0.14%	0.20%	$13,306	0.11%	0.13%
Nevada	$5,035	0.05%	0.08%	$28,556	0.04%	0.05%	$52,775	0.03%	0.03%
New Hampshire	$1,847	0.14%	0.21%	$14,658	0.07%	0.10%	$40,894	0.04%	0.04%
New Jersey	$4,942	0.05%	0.08%	$14,955	0.07%	0.10%	$38,095	0.04%	0.05%
New Mexico	$1,916	0.14%	0.21%	$10,299	0.10%	0.14%	$21,798	0.07%	0.08%
New York	$1,288	0.21%	0.31%	$9,680	0.11%	0.15%	$24,993	0.06%	0.07%
North Carolina	$1,425	0.19%	0.28%	$19,620	0.05%	0.07%	$51,290	0.03%	0.03%
North Dakota	$448	0.59%	0.88%	$7,610	0.14%	0.19%	$46,368	0.03%	0.04%
Ohio	$1,125	0.24%	0.35%	$12,823	0.08%	0.11%	$25,668	0.06%	0.07%
Oklahoma	$726	0.36%	0.54%	$8,374	0.12%	0.17%	$14,281	0.11%	0.12%
Oregon	$1,509	0.18%	0.26%	$13,182	0.08%	0.11%	$27,867	0.05%	0.06%
Pennsylvania	$608	0.44%	0.65%	$5,349	0.19%	0.27%	$12,998	0.12%	0.13%
Rhode Island	$8,527	0.03%	0.05%	$27,969	0.04%	0.05%	$48,226	0.03%	0.04%
South Carolina	$839	0.32%	0.47%	$7,063	0.15%	0.20%	$14,310	0.11%	0.12%
South Dakota	$558	0.47%	0.71%	$7,621	0.14%	0.19%	$8,090	0.19%	0.22%
Tennessee	$2,295	0.12%	0.17%	$18,560	0.06%	0.08%	$36,088	0.04%	0.05%
Texas	$958	0.28%	0.41%	$8,172	0.13%	0.18%	$16,345	0.09%	0.11%
Utah	$833	0.32%	0.47%	$9,206	0.11%	0.16%	$15,178	0.10%	0.11%
Vermont	$920	0.29%	0.43%	$7,764	0.13%	0.18%	$6,409	0.24%	0.27%
Virginia	$2,375	0.11%	0.17%	$24,048	0.04%	0.06%	$51,142	0.03%	0.03%
Washington	$2,194	0.12%	0.18%	$14,436	0.07%	0.10%	$30,521	0.05%	0.06%
West Virginia	$1,033	0.26%	0.38%	$7,424	0.14%	0.19%	$13,832	0.11%	0.13%
Wisconsin	$1,514	0.17%	0.26%	$12,257	0.08%	0.12%	$27,714	0.05%	0.06%

	< 10,000			10,000 - 24,999			25,000 - 49,999		
State	Avg Revenue	Avg. Economic Impact (low estimate)	Avg. Economic Impact (high estimate)	Avg. Revenue	Avg. Economic Impact (low estimate)	Avg. Economic Impact (high estimate)	Avg. Revenue	Avg. Economic Impact (low estimate)	Avg. Economic Impact (high estimate)
Wyoming	$1,878	0.14%	0.21%	$15,921	0.06%	0.09%	$42,841	0.04%	0.04%

Although it appears from Table 8-4 that on average small municipalities would not experience substantial economic impacts from the proposed SSO rule, actual municipal revenues could vary significantly from average revenues. To account for this uncertainty, a sensitivity analysis was performed on any state whose revenue test equaled or exceeded 0.50 percent. Municipalities with populations under 10,000 in Arkansas, Iowa, Missouri, Nebraska, North Dakota, Pennsylvania and South Dakota met this criterion (based on the upper-estimate average annual cost per community).

The number of potentially affected municipalities in these states could not be obtained from the Clean Water Needs Database. As a result, it was assumed that 77 percent of the municipalities reported in the 1992 Census could be impacted by the proposed SSO rule,[81] and that the remaining municipalities are served by septic systems. Table 8-5 summarizes the sensitivity analysis.

Table 8-5: Number of entities potentially affected annually

State	*Avg. Economic Impact (% cost/revenue)*	*# of Municipalities Impacted, by Permit-year (20% per year)*	*% Affected Small Entities per Year*
Arkansas	0.70%	73	0.39%
Iowa	0.51%	145	0.78%
Missouri	0.57%	140	0.75%
Nebraska	0.53%	90	0.49%
North Dakota	0.88%	61	0.33%
Pennsylvania	0.65%	365	1.96%
South Dakota	0.71%	54	0.29%
TOTAL		**927**	**4.99%**

Given that the highest average economic impact reviewed is not expected to exceed 0.88 percent of annual revenue, Table 8-5 presents an extremely conservative view of the number of municipalities potentially affected by the SSO rule. Moreover, many of the smallest municipalities may utilize a regional

[81] Obtained by dividing the total number of municipalities under 10,000 that have sanitary sewer collection systems (16,359) by the total number of municipalities under 10,000 identified in the 1992 census (21,185).

waste water treatment plant, thus incurring no costs to implement the proposed SSO rule. Thus, it is highly unlikely that even five percent of potentially affected entities would incur compliance costs exceeding one-half of one percent of revenue.

The proposed SSO rule would affect a total of 18,595 small municipal entities. Small entities are expected to be impacted by less than 1 % of annual revenues. On the basis of this analysis, the proposed SSO rule would not have a significant economic impact on a substantial number of small entities.

8.2 Impacts on Tribes

To assess the impact of the proposed SSO rule on American Indian reservations, EPA applied the same revenue test used to measure the rule's impact on small municipalities. As a result of this test, the Agency has determined that the proposed SSO rule will not have a significant impact on American Indian reservations.

There are approximately 550 federally recognized tribes and native villages in the contiguous 48 states and Alaska.[82] EPA used population and geographic data from the *1990 Census of Population* to develop revenue figures for the reservations potentially affected by the proposed SSO rule. The Census Bureau tabulates census data for several geographic entities that cover areas of American Indian and Alaska Native settlement, collectively termed American Indian and Alaska Native areas (AIANAs).

The major types of AIANAs are American Indian reservations and trust lands, tribal jurisdiction statistical areas, Alaska Native Regional Corporations, Alaska Native village statistical areas, and tribal designated statistical areas. Because reservations are the only AIANAs over whose land tribal governments exercise jurisdiction, EPA assumed that only the governments of American Indian reservations would be potentially affected by the proposed SSO rule.

American Indian reservations are areas with boundaries established by treaty, statute, or executive or court order. The 1990 census identified 310 reservations in the 48 contiguous states and Alaska.[83] However, most reservations are located outside metropolitan areas where sanitary sewers are less common. EPA assumed that reservations with populations under 1,000 did not have public sanitary sewer systems, as a result only 102 reservations could potentially be affected by the proposed SSO rule.

To estimate revenues for each reservation, EPA adjusted state municipal per capita revenue

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[82] Indian Entities Recognized and Eligible To Receive Services From the United States Bureau of Indian Affairs, 63 Fed. Reg. 71,941 (1998).

[83] Population, Land area, and Poverty Data for American Indian and Alaska Native Areas, *American Indian Reservations and Trust Lands*, 1990 Summary Tape Files 1C and 3C.

estimates[84] by the ratio of per capita income on the reservation[85] to per capita income for the states.[86] In calculating total reservation revenues, EPA used 1990 census population figures modified by a population growth factor to approximate 1998 population levels.[87]

EPA calculated compliance costs for each reservation using municipal per capita costs by population size. The compliance costs were then modified to reflect the percentage of households on each reservation with access to public sanitary sewers.[88] For reservations without sewer data, EPA assumed that the 48.2 percent national average of American Indian households with public sewer service applied. Table 8-1 summarizes the revenue test for American Indian reservations. Reservations experiencing economic impacts greater than one percent of costs over revenues are highlighted.

Table 8-6: Revenue test for American Indian reservations

Name	State	Population	Annual Revenue	Adjusted Annual Costs	Economic Impact
Annette Islands Reserve	AK	1,675	5,078,000	$1,502	0.03%
Fort Apache Reservation	AZ	11,849	2,352,000	$7,128	0.30%
Gila River Reservation	AZ	10,876	2,159,000	$9,488	0.44%
Hopi Reservation	AZ	8,390	2,171,000	$7,257	0.33%
Papago Reservation	AZ	9,952	2,575,000	$6,664	0.26%
Pascua Yaqui Reservation	AZ	2,750	711,000	$5,064	0.71%
Salt River Reservation	AZ	5,531	1,431,000	$1,955	0.14%
San Carlos Reservation	AZ	8,315	2,152,000	$11,445	0.53%
San Xavier Reservation	AZ	1,336	346,000	$1,198	0.35%
Colorado River Reservation	AZ--CA	8,966	4,111,000	$8,355	0.20%
Fort Yuma (Quechan) Reservation	AZ--CA	2,376	1,089,000	$2,130	0.20%
Zuni Pueblo	AZ--NM	8,450	2,325,000	$14,444	0.62%
Navajo Reservation	AZ--NM--UT	146,326	32,889,000	$20,772	0.06%
Agua Caliente Reservation	CA	23,035	9,154,000	$8,882	0.10%
Bishop Rancheria	CA	1,605	1,063,000	$1,439	0.14%

[84] U.S. Bureau of the Census. 1997. 1992 Census of Governments: Vol. 4, No. 4: Finances of Municipal and Township Governments, Table 13. Document #GC92(4)-4. Converted to 1998 dollars using conversion factor of 1.15 calculated from the national income and product account tables of the U.S. Bureau of Economic Analysis.

[85] U.S. Bureau of the Census. 1994. 1990 Census of Population: Characteristics of American Indians by Tribe and Language, Table 6. Document 1990 CP 3-7. Converted to 1998 dollars.

[86] Bureau of Economic Analysis, Regional Accounts Data, State Personal Income: Per Capita Personal Income.

[87] The growth factor of 1.14 was calculated from the Resident Population Estimates of the United States by Sex, Race, and Hispanic Origin: April 1, 1999 to November 1, 1999.

[88] U.S. Bureau of the Census. 1995. Statistical Brief: Housing of American Indians on Reservations -- Plumbing. Document SB/95-9.

Name	State	Population	Annual Revenue	Adjusted Annual Costs	Economic Impact
Hoopa Valley Reservation	CA	2,443	1,617,000	$41	0.00%
Morongo Reservation	CA	1,222	809,000	$1,096	0.14%
Pala Reservation	CA	1,221	808,000	$1,095	0.14%
Rincon Reservation	CA	1,541	1,020,000	$1,382	0.14%
Round Valley Reservation	CA	1,349	893,000	$1,209	0.14%
Torres-Martinez Reservation	CA	1,667	1,103,000	$1,494	0.14%
Yurok Reservation	CA	1,547	1,024,000	$1,387	0.14%
Southern Ute Reservation	CO	8,897	3,497,000	$7,976	0.23%
Ute Mountain Reservation	CO--NM--UT	1,498	385,000	$1,343	0.35%
Hollywood Reservation	FL	1,589	622,000	$1,425	0.23%
Omaha Reservation	IA--NE	5,959	1,069,000	$5,342	0.50%
Coeur d'Alene Reservation	ID	6,612	1,154,000	$5,928	0.51%
Fort Hall Reservation	ID	5,768	1,007,000	$2,854	0.28%
Nez Perce Reservation	ID	18,422	3,861,000	$9,329	0.24%
Potawatomi (Kansas) Reservation	KA	1,233	320,000	$1,105	0.35%
Isabella Reservation	MI	26,072	8,905,000	$10,053	0.11%
L'Anse Reservation	MI	3,731	1,381,000	$3,345	0.24%
Fond du Lac Reservation	MN	3,681	1,025,000	$3,300	0.32%
Leech Lake Reservation	MN	9,883	2,752,000	$11,471	0.42%
Red Lake Reservation	MN	4,217	1,174,000	$2,243	0.19%
White Earth Reservation	MN	9,949	2,770,000	$6,884	0.25%
Mississippi Choctaw Reservation	MS	4,311	1,482,000	$4,458	0.30%
Blackfeet Reservation	MT	9,746	4,160,000	$13,034	0.31%
Crow Reservation	MT	7,257	3,098,000	$6,857	0.22%
Flathead Reservation	MT	24,235	5,932,000	$9,597	0.16%
Fort Belknap Reservation	MT	2,859	1,221,000	$3,191	0.26%
Fort Peck Reservation	MT	12,078	2,956,000	$8,049	0.27%
Northern Cheyenne Reservation	MT	4,472	1,909,000	$5,099	0.27%
Rocky Boy's Reservation	MT	1,764	753,000	$1,581	0.21%
Eastern Cherokee Reservation	NC	7,441	2,114,000	$4,872	0.23%
Devils Lake Sioux Reservation	ND	4,090	374,000	$3,895	1.04%
Fort Berthold Reservation	ND	6,150	563,000	$8,053	1.43%
Turtle Mountain Reservation	ND	5,685	520,000	$4,991	0.96%
Lake Traverse (Sisseton) Reservation	ND--SD	12,236	1,268,000	$6,108	0.48%
Standing Rock Reservation	ND--SD	9,070	1,245,000	$13,007	1.04%
Winnebago Reservation	NE	2,669	417,000	$2,393	0.57%
Acoma Pueblo	NM	2,953	774,000	$2,746	0.35%
Alamo Navajo Reservation	NM	1,449	380,000	$1,299	0.34%
Canoncito Reservation	NM	1,355	356,000	$1,215	0.34%
Cochiti Pueblo	NM	1,530	401,000	$1,372	0.34%
Isleta Pueblo	NM	3,323	872,000	$3,696	0.42%
Jemez Pueblo	NM	1,995	523,000	$1,789	0.34%
Jicarilla Apache Reservation	NM	2,983	783,000	$4,505	0.58%
Laguna Pueblo	NM	4,253	1,116,000	$6,178	0.55%
Mescalero Apache Reservation	NM	3,072	806,000	$3,811	0.47%
Nambe Pueblo	NM	1,598	419,000	$1,433	0.34%
Picuris Pueblo	NM	2,145	563,000	$1,923	0.34%
Pojoaque Pueblo	NM	2,914	764,000	$2,612	0.34%
San Felipe Pueblo	NM	2,775	728,000	$2,488	0.34%

Name	State	Population	Annual Revenue	Adjusted Annual Costs	Economic Impact
San Ildefonso Pueblo	NM	1,709	448,000	$1,532	0.34%
San Juan Pueblo	NM	5,938	1,558,000	$5,324	0.34%
Sandia Pueblo	NM	4,527	1,187,000	$4,059	0.34%
Santa Clara Pueblo	NM	11,620	2,988,000	$4,481	0.15%
Santo Domingo Pueblo	NM	3,411	895,000	$3,058	0.34%
Taos Pueblo	NM	5,336	1,400,000	$4,784	0.34%
Duck Valley Reservation	NV	1,255	398,000	$1,125	0.28%
Pyramid Lake Reservation	NV	1,582	502,000	$1,418	0.28%
Allegany Reservation	NY	8,339	2,145,000	$7,476	0.35%
Cattaraugus Reservation	NY	2,483	639,000	$337	0.05%
St. Regis Mohawk Reservation	NY	2,255	580,000	$59	0.01%
Osage Reservation	OK	47,081	15,133,000	$12,802	0.08%
Umatilla Reservation	OR	2,852	780,000	$2,557	0.33%
Warm Springs Reservation	OR	3,507	959,000	$5,049	0.53%
Cheyenne River Reservation	SD	8,827	990,000	$11,788	1.19%
Crow Creek Reservation	SD	2,002	225,000	$1,795	0.80%
Lower Brule Reservation	SD	1,280	144,000	$1,148	0.80%
Pine Ridge Reservation	SD	12,979	2,250,000	$5,378	0.24%
Rosebud Reservation	SD	9,521	1,068,000	$12,290	1.15%
Yankton Reservation	SD	7,147	802,000	$6,407	0.80%
Uintah and Ouray Reservation	UT	19,635	2,239,000	$8,891	0.40%
Colville Reservation	WA	7,931	2,818,000	$6,992	0.25%
Lummi Reservation	WA	3,588	1,275,000	$3,217	0.25%
Makah Reservation	WA	1,384	492,000	$1,241	0.25%
Muckleshoot Reservation	WA	4,379	1,556,000	$3,926	0.25%
Port Madison Reservation	WA	5,511	1,958,000	$4,941	0.25%
Puyallup Reservation	WA	36,927	12,494,000	$7,831	0.06%
Quinault Reservation	WA	1,386	493,000	$1,243	0.25%
Spokane Reservation	WA	1,712	608,000	$1,535	0.25%
Swinomish Reservation	WA	2,601	924,000	$2,332	0.25%
Tulalip Reservation	WA	8,097	2,877,000	$7,259	0.25%
Yakima Reservation	WA	31,375	10,616,000	$5,439	0.05%
Bad River Reservation	WI	1,220	314,000	$1,094	0.35%
Lac Courte Oreilles Reservation	WI	2,745	707,000	$378	0.05%
Lac du Flambeau Reservation	WI	2,775	714,000	$2,488	0.35%
Menominee Reservation	WI	3,873	997,000	$3,919	0.39%
Oneida (West) Reservation	WI	20,558	5,001,000	$5,049	0.10%
Wind River Reservation	WY	24,910	6,556,000	$6,835	0.10%

The proposed SSO rule is not expected to have a significant impact on a substantial number of American Indian reservations. Of the 102 reservation potentially affected by the rule, only five would be expected to experience economic impacts slightly greater than one percent of cost over revenue.

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APPENDIX A Explanation of the Basis for Categorizing Specific Provisions in the Proposed Rule as Clarifying

This appendix addresses the clarifying provisions in the proposed regulation. The clarifying provisions will be compared to already existing requirements in order to demonstrate that these clarifying provisions add no new substantive requirements beyond what is already required by the CWA and existing NPDES regulations. Clarifying provisions in the proposed regulation appear under the following major topic areas addressed by the proposed regulation:

1) Record keeping and reporting;

2) CMOM;

3) The prohibition on municipal sanitary sewer system discharges; and

4) Satellite collection systems.

A.1 Record Keeping and Reporting

A.1.1 Record keeping

Under the proposed regulation, the permittee is required to maintain detailed records of SSOs which occurred during the previous 3 years. These records must include the cause or suspected cause of the overflow, and steps taken to prevent a recurrence of the overflow. This proposed provision clarifies existing requirements for detecting and documenting SSOs. Existing NPDES regulations require permittees to

> retain records of all monitoring information,..., copies of all reports required by [the NPDES] permit, and records of all data used to complete the application for [the NPDES] permit, for a period of at least 3 years from the date of the sample, report or application. [40 CFR 122.41(j)(2)].

A.1.2 Reporting

A.1.2.1 24-hour and follow-up reports

The proposed regulation specifies the content and format of 24-hour and follow-up reports required to be submitted to the NPDES authority after an SSO occurs. The permittee is required to submit an oral or electronic report within 24 hours after the permittee becomes aware of an overflow that may imminently or substantially endanger human health. A more detailed written report must be submitted within 5 days of

the time the permittee becomes aware of the overflow. Among other details, this report must include a description of the sewer system component from which the release occurred (e.g. manhole, constructed overflow pipe, crack in pipe); the cause or suspected cause of the overflow; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow; a schedule of major milestones for those steps; steps taken or planned to mitigate the impact(s) of the overflow; and a schedule of major milestones for those steps.

The proposed provisions requiring 24-hour and 5-day follow-up reports restate and clarify existing requirements at 40 CFR 122.41(l)(6), which state that

> (i) [t]he permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becames aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (ii) The following shall be included as information which must be reported within 24 hours under this paragraph. (A) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See Sec. 122.41(g)). (B) Any upset which exceeds any effluent limitation in the permit. (C) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours.

The proposed provision clarifies that the language in existing regulations -- "any noncompliance which may endanger health or the environment" -- is interpreted to mean "an overflow that may imminently or substantially endanger human health."

A.1.2.2 Waiver of 5-day follow-up report requirement

The proposed rule stipulates that the NPDES Director may waive the requirement to provide a 5-day written report on a case-by-case basis. This proposed waiver provision clarifies the existing authority of the NPDES Director to waive written report requirements. Existing regulations state that

> The Director may waive the written report on a case-by-case basis for reports under paragraph (l)(6)(ii) of this section if the oral report has been received within 24 hours [40 CFR 122.41(l)(6)(iii)].

The proposed waiver provision clarifies that the existing requirement allowing for waivers of 24-hour reports

on a case-by-case basis applies equally to the new requirement for a detailed 5-day written report.

A.1.3 Discharge monitoring reports

Under the proposed rule, discharges that reach waters of the United States must be included on the discharge monitoring report (DMR). The DMR must specify the number and location of overflows discharging to waters of the United States that resulted from flows exceeding the capacity of the collection system, and overflows that are unrelated to the capacity of the collection system.

The proposed provisions requiring permittees to submit Discharge Monitoring Reports for discharges to waters of the U.S. restate and clarify existing requirements at 40 CFR 122.41(l)(6), which appear in the preceding discussion on 24-hour and follow-up reports, and 40 CFR 122.41(l)(7). The latter requirement states that

> [t]he permittee shall report all instances of noncompliance not reported under paragraphs (l)... (6) of this section [addressing 24-hour and follow-up reports] at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (l)(6) of this section [i.e., the information to be contained in 24-hour and follow-up reports].

As noted above, the clarified 24-hour and follow-up reporting proposed requirements pertain to overflows which imminently or substantially endanger human health. The clarified DMR requirement complements the clarified 24-hour and follow-up reporting proposed requirements by:

- Providing a name (DMR) to the report which, pursuant to 122.41(l)(7), addresses instances of noncompliance that are not addressed in 24-hour and follow-up reports; and

- Specifying that the DMR should specifically be used to report all discharges to waters of the U.S., including those described in 122.41(l)(6)(ii).

A.2 Capacity, Management, Operation, and Maintenance (CMOM) Programs for Municipal Sanitary Sewer Systems

The proposed SSO rule would prescribe requirements for implementing a CMOM program for municipal sanitary sewer systems that at a minimum addresses General Standards, a Management Program, an Overflow Response Plan, a System Evaluation and Capacity Assurance Plan, CMOM Program Audits, and Communications.

A.2.1 General standards

The proposed regulations set forth five general performance standards for permit holders. Three of these five standards clarify existing requirements and do not add new requirements. These standards require that permit holders:

1) Properly manage, operate and maintain, at all times, all parts of collection system that they own or over which they have operational control;

2) Provide adequate capacity to convey base flows and peak flows for all parts of the collection system they own or over which they have operational control;

3) Take all feasible steps to stop, and mitigate the impact of, sanitary sewer overflows in portions of the collection system they own or over which they have operational control.

The first proposed general performance standard listed above is a clarification of existing NPDES regulations at sections 122.41(d) and (e), which state that

> [the permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of [the NPDES] permit which has a reasonable likelihood of adversely affecting human health and the environment [section (d)]; [and]
>
> [the permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with [the NPDES] permit [section (e)].

The new regulatory language clarifies that the existing requirement to properly operate and maintain "all facilities and systems of treatment and control (and related appurtenances)" applies to all parts of the collection system that the permittee owns or over which he has operational control, and that the existing requirement to minimize or prevent unauthorized discharges necessitates proper management of collection systems. It does not add any new requirement, and therefore does not contribute to the incremental costs associated with the proposed regulation.

The second proposed performance standard, which addresses capacity, is another clarification of existing NPDES regulations at section 122.41(d) and (e). The new regulatory language makes explicit EPA's understanding that the provision of adequate capacity to convey base and peak flows is a "reasonable" and fundamental step in efforts to prevent SSOs, and that provision of adequate capacity is part of what constitutes "proper operation." Again, the new performance standard simply clarifies existing requirements, and does not add any new incremental costs. Similarly, the third proposed standard simply clarifies that reasonable steps to minimize or prevent any discharge (including SSOs) should be understood to include "all feasible steps to stop, and mitigate the impact of, SSOs".

The two general performance standards in the proposed regulation that create new requirements and impose new incremental compliance costs are the standards requiring that permittees notify the public and develop written summaries of CMOM programs. The incremental costs associated with these proposed provisions are discussed in subsection 5.3.

A.2.2 CMOM management program

A.2.2.1 Include legal authority

Proposed CMOM provisions require permittees to include legal authority, through sewer use ordinances, service agreements or other legally binding documents, to establish requirements in a number of areas. These measures are addressed in Section 5.3. An additional "legal authority" provision requires permittees to include legal authority to implement the general and specific prohibitions of the national pretreatment program to which they are subject under 40 CFR 403.5. This provision clarifies that including legal authority to implement pretreatment prohibitions is necessary to meet the existing pretreatment requirements at 40 CFR 403.5. No new requirements or costs are imposed by this provision.

A.2.2.2 Measures and activities

Three proposed CMOM provisions under "measures and activities" require permittees to address the following activities in their CMOM management programs, and to identify the person or position responsible for these activities:

1) Maintenance of facilities;

2) Routine preventive operation and maintenance (O&M).

These requirements clarify existing regulations requiring the permittee to "properly operate and maintain" the collection system (§ 122.41(e)). They make explicit EPA's understanding that collection systems which are properly operated and maintained will, by necessity, maintain their facilities and perform routine preventive operation and maintenance. The proposed routine preventive operation and maintenance requirement also clarifies existing regulations requiring the permittee to prevent discharges (§ 122.41(d), emphasis added). The new regulatory language serves to clarify the meaning of existing O&M requirements, and does not add any new obligations. These provisions therefore do not contribute to the incremental costs of the proposed regulation.

Another proposed CMOM "measures and activities" provision requires that the CMOM program address equipment and replacement parts inventories, including identification of critical replacement parts. This provision clarifies terms and implied requirements contained in existing regulations. The existing

requirement to properly operate and maintain the collection system at 122.41(e) also requires:

> ...the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

The proposed provision clarifies that:

1) The existing requirement to operate back-up facilities implies a requirement for permittees to be prepared for situations in which such facilities would be needed; and

2) This requirement to be prepared implies, in turn, that permittees must maintain an inventory of critical replacement parts, since such an inventory is fundamental to being prepared.

The provision does not add any new obligations, and therefore does not contribute to the costs of the proposed rule.

A.3 Overflow Response Plans

The proposed rule requires that permittees identify mechanisms in their Overflow Response Plans to ensure that permittees are made aware of all overflows (to the greatest extent possible). This provision is a clarification of existing NPDES regulations at section 122.41(d), which state that

> [the permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of [the NPDES] permit which has a reasonable likelihood of adversely affecting human health and the environment.

This proposed rule clarifies that, in order to meet the existing requirement to minimize or prevent any unauthorized discharge, it is necessary to have some means of ensuring that the permittee is made aware of all overflows. Permittees furthermore have an existing duty under common law to know of the harm that their activities may cause to others.

The overflow response plan must identify mechanisms to ensure that overflows are appropriately responded to, including ensuring that reports of overflows are immediately dispatched to appropriate personnel for investigation and immediate response. This requirement also clarifies existing requirements at section 122.41(d) to take all reasonable steps to minimize or prevent discharges. Therefore, no new incremental costs are associated with ensuring response to overflows.

The proposed overflow response plan must also identify mechanisms to ensure appropriate

reporting, as defined in the proposed reporting requirements. These proposed requirements, which clarify existing reporting requirements, are addressed in subsection 4.1.

The overflow response plan must also identify mechanisms to provide emergency operations. Again, this provision clarifies existing requirements at section 122.41(d) to take all reasonable steps to minimize or prevent discharges. Therefore, no new incremental costs are associated with providing emergency operations.

A.4 System Evaluation and Capacity Assurance Plan

One of the proposed capacity evaluation and capacity assurance plan provisions requires permittees to take steps to evaluate portions of the collection system which are experiencing or contributing to an SSO discharge caused by hydraulic deficiency or to noncompliance at a treatment plant. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, provide estimates of the capacity of key system components, identify hydraulic deficiencies, including components of the system with limiting capacity and identify the major sources that contribute to the peak flows associated with overflow events.

This provision clarifies existing regulations at 122.41(e) for proper operation, and makes explicit EPA's understanding that evaluation of the capacity and hydraulic deficiencies of the collection system is an integral part of proper operation. Therefore, no new incremental costs are associated with capacity evaluation.

A.5 Prohibition on Municipal Sanitary Sewer System Discharges

A.5.1 Prohibition on discharges occurring prior to a POTW; clarification regarding bypass and upset provisions

Proposed provisions addressing the prohibition on municipal sanitary sewer system discharges stipulate that discharges occurring prior to a publicly owned treatment works (POTW) treatment facility are prohibited. This clarification follows directly from the Clean Water Act prohibition on point source discharges of pollutants to waters of the United States that are not authorized by a NPDES permit. NPDES permits for municipal sanitary sewer systems specifically address discharges from POTWs (see 33 USC 1311, 40 CFR 122.44), and not from any other part of the collection system. The proposed provision simply affirms that which is implied by omission in existing regulations.

The prohibition provisions further specify that neither the bypass nor the upset provisions at 40 CFR 122.41(m) and (n) apply to these discharges. This proposed provision serves to clarify existing regulatory requirements at 40 CFR 122.41 (m) and (n). The existing requirements define a bypass as

the intentional diversion of waste streams from any portion of a treatment facility [emphasis added][40 CFR 122.41(m)(1)(ii)].

Existing requirements define an upset as:

> an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee [40 CFR 122.41(n)(1)].

Existing upset and bypass provisions were intended to apply strictly to discharges from a POTW, and not from points in the collection system prior to a POTW. As noted above, the existing regulations prohibit municipal sanitary sewer system discharges prior to a POTW, and set NPDES permit conditions which specifically apply to POTW discharges. Any conditions pertaining to the POTW permit therefore do not apply to discharges from any other part of the collection system. By specifying that existing upset and bypass regulatory provisions do not pertain to discharges occurring prior to a POTW, the proposed language on SSO prohibitions helps clarify existing requirements. The clarifying provisions do not change existing requirements, and therefore do not impose any incremental costs.

A.5.2 Discharges caused by severe natural conditions

The proposed regulation specifies the conditions under which the NPDES authority would not take enforcement action to address a prohibited municipal sanitary sewer system discharge. Under the proposed regulation, the permittee must demonstrate through properly signed, contemporaneous operating logs, or other relevant evidence, that:

17) The discharge was caused by severe natural conditions (such as hurricanes, tornados, widespread flooding, earthquakes, tsunamis, and other similar natural conditions);

18) There were no feasible alternatives to the discharge, such as the use of auxiliary treatment facilities, retention of untreated wastewater, reduction of inflow and infiltration, use of adequate backup equipment, or an increase in the capacity of the system. This provision is not satisfied if, in the exercise of reasonable engineering judgment, the permittee should have installed auxiliary or additional collection system components, wastewater retention or treatment facilities, adequate back-up equipment or should have reduced inflow and infiltration; and

19) The permittee submitted a claim to the Director within 10 days of the date of the discharge that the discharge meets the conditions of this provision.

The proposed provisions which define severe natural conditions and specify circumstances justifying an exemption from enforcement actions are intended to provide clarification regarding when extreme conditions can be considered to provide the basis for an affirmative defense. To do so, the provisions

borrow from, reorganize, and expand upon existing regulatory language regarding bypasses and upsets. As noted in the previous section (A.5.1), bypass and upset provisions only apply to discharges at the treatment facility. The proposed provisions addressing severe natural conditions pertain to any discharge from the collection system, whether prior to or at the treatment facility. A side-by-side comparison of existing regulatory language and the proposed clarifications is provided below.

Table A-1: Existing bypass and upset provisions and proposed provisions addressing discharges caused by severe natural conditions: Side-by-side analysis

Existing regulations Permittees must demonstrate that:	**Proposed regulation** Permittees must demonstrate that:
1) An upset occurred (upset is defined as an exceptional incident in which there is unintentional and temporary non-compliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee). [40 CFR 122.41(n)(1) and (n)(3)(i)]	1) Discharge was caused by severe natural conditions (such as hurricanes, tornados, widespread flooding, earthquakes, tsunamis, and other similar natural conditions)
2) There were no feasible alternatives to the bypass, such as: A) the use of auxiliary treatment facilities B) retention of untreated wastes C) maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance. [40 CFR 121.41(m)(4)(B)].	2) There were no feasible alternatives to the discharge, such as: A) the use of auxiliary treatment facilities B) retention of untreated wastewater C) reduction of inflow and infiltration D) use of adequate backup equipment, or E) an increase in the capacity of the system. This provision is not satisfied if, in the exercise of reasonable engineering judgment, the permittee should have installed auxiliary or additional collection system components, wastewater retention or treatment facilities, adequate back-up equipment or should have reduced inflow and infiltration.
3) The permittee submitted [24-hour] notice of the upset (or unanticipated bypass). [40 CFR 122.41(n)(3)(iii), referencing 122.41(l)(6)(ii)(B); 40 CFR 122.41(m)(3)(ii), referencing 122.41(l)(6)(A)]	3) The permittee submitted a claim to the Director within 10 days of the date of the discharge that the discharge meets the conditions of this provision.

Note: The original order in which requirements appear in regulations has been altered to facilitate comparison.

As discussed in section A.5.1, 40 CFR 122.41(n) defines upsets as incidents of noncompliance resulting from "factors beyond the reasonable control of the permittee". The proposed language defining severe natural conditions as hurricanes, tornados, widespread flooding, etc. is intended to clarify what is meant in existing regulations by "factors beyond the reasonable control of the permittee."

The proposed regulation adds two "feasible alternatives to the discharge" which were not already listed in the existing regulation: "reduction of inflow and infiltration", and "increase in the capacity of the system." These provisions are clarifications of the original language, which was intended to cover all measures that should be considered within the "reasonable control" of the permittee. In addition, they involve measures which are necessary to meet other existing regulatory requirements. Reduction of inflow and infiltration and increasing the capacity of the collection system are measures that are necessary to ensure compliance with the prohibition on unauthorized discharges. I/I control and prevention is also necessary to ensure "proper operation and maintenance" of "all facilities and systems of treatment and control (and related appurtenances)", which is required under existing regulations [40 CFR 122.41(e)]. Consequently, EPA has determined that adding this language simply clarifies existing requirements, and does not create any new requirements.

The proposed regulation also requires that the permittee submit a claim to the Director within 10 days of the discharge event that the discharge met the criteria for excused discharges caused by factors other than severe natural conditions. The requirement to submit documentation in order to establish an affirmative defense is implicit in the existing regulatory language at 40 CFR 122.41(n)(3), which states that permittees must

> demonstrate, through properly signed, contemporaneous operating logs, that: (i) An upset occurred and that the permittee can identify the cause(s) of the upset; [and] (ii) The permitted facility was at the time being properly operated..."

The proposed requirement that a claim be submitted within 10 days of the discharge event clarifies the existing requirement for permittees to provide documentation demonstrating the basis for an affirmative defense.

A.5.3 Discharges caused by other factors

For prohibited discharges that occur prior to a POTW treatment facility, and that do not meet the criteria for discharges caused by severe natural conditions, the proposed regulation specifies how the permittee may establish an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations. To establish such a defense, the permittee would be required to demonstrate through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) The permittee can identify the cause of the discharge event;

(2) The discharge was exceptional, unintentional, temporary and caused by factors beyond the reasonable control of the permittee;

(3) The discharge could not have been prevented by the exercise of reasonable control, such as proper management, operation and maintenance; adequate treatment facilities or collection system facilities or components (e.g. adequately enlarging treatment facilities or collection facilities to accommodate growth or adequate infiltration and inflow control and prevention); preventative maintenance; or adequate backup equipment that should have been installed;

(4) The permittee submitted a claim to the Director within 10 days of the date of the discharge that the discharge meet the conditions of this provision; and

(5) The permittee took all reasonable steps to stop, and mitigate the impact of, the discharge as soon as possible.

The proposed rule also specifies that in any enforcement proceeding, the permittee has the burden of proof to establish that the above criteria have been met.

Proposed provisions addressing discharges caused by factors other than severe natural conditions quote from, reorganize, and expand on existing regulatory language on upsets. A side-by-side comparison of existing regulatory language and the proposed clarifications are provided below.

Table A-2: Existing upset provisions and proposed provisions addressing discharges caused by factors other than severe natural conditions: Side-by-side analysis

Existing regulations Permittees must demonstrate that:	**Proposed regulation** Permittees must demonstrate that:
Discharge was not caused by: 1) operational error, or careless or improper operation 2) inadequate treatment facilities, or improperly designed treatment facilities 3) lack of preventative maintenance [40 CFR 122.41(n)(1) and (n)(3)(ii)]]	Discharge could not have been prevented by the exercise of reasonable control, such as: 1) proper management, operation and maintenance 2) adequate treatment facilities or collection system facilities or components (e.g. adequately enlarging treatment facilities or collection facilities to accommodate growth) 3) preventative maintenance 4) lack of adequate infiltration and inflow control and prevention.. 5) adequate backup equipment that should have been installed
The permittee can identify the cause(s) of the upset (defined as an exceptional incident in which there is unintentional and temporary non-compliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee). [40 CFR 122.41(n)(1) and (n)(3)(i).]	The permittee can identify the cause of the discharge event, and that the discharge was exceptional, unintentional, temporary and caused by factors beyond the reasonable control of the operator.
Permittee complied with remedial measures to minimize and prevent discharge [40 CFR 122.41(n)(3)(iv), referencing 122.41(d)]	Permittee took all reasonable steps to stop, and mitigate the impact of, the discharge as soon as possible.
The permittee submitted [24-hour] notice of the upset. [40 CFR 122.41(n)(3)(iii), referencing 122.41(l)(6)(ii)(B)]	The permittee submitted a claim to the Director within 10 days of the date of the discharge that the discharge meet the conditions of this provision.
Burden of proof – In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]	Burden of proof – In any enforcement proceeding, the permittee has the burden of proof to establish that the criteria in this section have been met.

Note: The original order in which requirements appear in regulations has been altered to facilitate comparison.

As can be seen in Table A-2, many of the proposed provisions on discharges caused by other factors paraphrase or restate the existing regulatory language, and therefore do not change existing requirements. Those provisions which clarify and/or elaborate on existing requirements are as follows.

The proposed regulation clarifies that adequate, properly designed treatment facilities are facilities that are adequately enlarged to accommodate growth. It also specifies that collection facilities are expected to be enlarged to accommodate growth. This expectation follows from the existing prohibition on discharges from the collection system prior to the POTW. Permittees are expected to undertake necessary measures to avoid unauthorized discharges from any part of the system. This would include enlarging the collection system in areas where increased flows associated with population growth could overwhelm the existing capacity of any part of the system, resulting in overflows.

The proposed regulation includes providing adequate infiltration and inflow control and prevention in its definition of "the exercise of reasonable control". Adequate infiltration and inflow (I/I) control and prevention, like expansion of treatment and collection facilities to accommodate growth, is an activity which is necessary to meet the existing prohibition on unauthorized discharges. I/I control and prevention is also necessary to ensure "proper operation and maintenance" of "all facilities and systems of treatment and control (and related appurtenances)", which is required under existing regulations [40 CFR 122.41(e)].

The proposed regulation also requires permittees to demonstrate that a discharge could not have been prevented by the installation of adequate backup equipment. In this case, the proposed language restates existing regulatory requirements addressing bypasses. Under current requirements, a bypass cannot be excused

> if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass... [40 CFR 122.41(m)(4)(B)].

Lastly, the proposed regulation requires that the permittee submit a claim to the Director within 10 days of the discharge event that the discharge met the criteria for excused discharges caused by factors other than severe natural conditions. As noted above in subsection A.5.2, the proposed requirement that a claim be submitted within 10 days of the discharge event clarifies the existing requirement at 40 CFR 122.41(n)(3) for permittees to provide documentation demonstrating the basis for an affirmative defense.

A.6 Satellite Collection Systems

The proposed rule defines municipal satellite sewer system as follows:

> ...any device or system that meets each of the following criteria: (1) is owned by a State or

municipality, (2) is used to convey municipal sewage or industrial waste to a treatment facility that has or has applied for a NPDES permit, and (3) the operator is not the owner or operator of the treatment facility that has or has applied for a NPDES permit.

The proposed rule would clarify that there is a Federal requirement to report SSOs to waters of the United States. The Federal reporting requirement will either: 1) be contained in a permit issued to the owner of the municipal satellite collection system; or 2) in the absence of a permit to the owner of the municipal satellite collection system, the owner of the municipal satellite collection system will be required to submit a permit application if a discharge to waters of the United States occurs. Permits for municipal satellite collection systems would contain the standard permit conditions for reporting, record keeping, public notification, and CMOM programs and the prohibition on SSO discharges.

Under existing regulations, municipal satellite sewer collection systems are already considered point sources that are subject to the NPDES program. The proposed provision clarifies existing regulations by explicitly requiring that satellite systems that discharge to waters of the United States must be covered by an NPDES permit.

APPENDIX B Activities, Assumptions and Methodology for Provisions in the Proposed Regulation That Add New Substantive Requirements

This section describes the provisions within the proposed SSO program that are clearly new requirements. Typical activities that could be undertaken to address each measures are described below, with assumptions and labor hours used to estimate the projected costs of each activity. It is important to bear in mind that these descriptions should not necessarily be interpreted as constituting adequacy for individual permitting authorities and particular systems.

B.1 Record Keeping and Reporting for Municipal Sanitary Sewer Systems

The Record Keeping and Reporting provisions of the proposed rule, consistent with the goals of the Agency for clarification of existing regulation, places a number of references to existing rule, guidance, manuals of practice[89], and standard permit conditions in a single reference for Sanitary Sewer Collection Systems.

Maintain Three Year Records of Work Orders

Activities: The work orders associated with investigation of system problems related to SSOs must be kept on file for three years.

Assumptions: While a new regulatory requirement, this activity is routinely conducted in accord with general record-keeping practices and the requirement for Discharge Monitoring Reports (DMRs). Additionally, system managers consider keeping records work orders for SSOs necessary to identify recurrence. This activity is considered standard industry practice as reflected in WEF *Manual of Practice No. 7*. For this reason, while a new regulatory requirement, the measure imposes no new costs.

Maintain Three Year Records of Customer Complaints

Activities: The customer or other complaints related to SSOs must be kept on file for three years.

Assumptions: While a new regulatory requirement, this activity is also routinely conducted in accord with general record-keeping practices and as implied by the requirement for Discharge Monitoring Reports (DMRs). Work order records typically attach the 'trigger' for the work order, which would be the customer/other complaint if that is the case. Additionally, this activity is considered standard industry practice as reflected in WEF *Manual of Practice No. 7.* For this reason, while a new regulatory requirement, the measure imposes no new costs.

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[89] WEF *Manual of Practice No. 7,* p. 101

Performance and Implementation Documentation

Activity: Documentation of performance and implementation measures must be kept for the previous three years.

Assumptions: The requirement for performance and implementation documentation makes clear that records must be kept necessary to support CMOM elements such as the CMOM Program Audit, the System Capacity and Enhancement Plan and its updates. This is also consistent with the requirement that information be managed to it is useful to prioritize appropriate CMOM activities.

This new requirement is therefore costed in the above-referenced sections of CMOM.

B.2 PUBLIC NOTICE OF MUNICIPAL SEWER SYSTEM OVERFLOWS

Immediate Notification of Public and Health Officials - Requires the permittee to provide notification to the public, health agencies, drinking water suppliers and other potentially affected entities of overflows that may imminently and substantially endanger human health.

Actions Required **-** In accordance with the public notification criteria and strategy developed in the Overflow Response Plan, the permittee would notify the appropriate parties.

Assumptions **-** It was assumed that 2 hours[90] per SSO event would be required to alert the appropriate parties.

Notify the public of overflows in areas where overflows have a potential to affect human health

Actions Required **-** In accordance with the public notification criteria and strategy developed in the Overflow Response Plan, the permittee would take action to notify the public in such a manner as would allow them to avoid exposure to the overflow. Beach/lake closure, flagging with yellow tape, and similar measures may be necessary.

Assumptions **-** It was assumed that 3 hours[91] would be required per SSO event to limit public access and

[90] Notification process should be similar to CSO requirement. Therefore, labor estimate from the CSO ICR estimate for this task (CSO ICR, 1998).

[91] Based on the CSO ICR estimate for this task (1998).

2 hours[92] per event to provide media notification. A $188 capital cost per system has been assumed to purchase temporary signage for public notice[93].

Annual Report - Requires the permittee to provide an annual report of all overflows in the sewer system. Systems serving fewer than 10,000 people are not required to file an annual report if all Discharge Monitoring Reports for the proceeding 12 months show no discharges from overflows.

***Actions Required* -** Prepare an annual report summarizing the information contained in the 24 hour, 5 day, and follow up reports and make it available to the public.

***Assumptions* -** It was assumed that preparing the report would require 1 hour of labor time per system, while storing and making available one copy of the report would require another 0.25 hours per system[94]. For systems serving more than 50,000 people, it was assumed that communities with websites (assumed to be 90%) would post the annual summary on their existing Internet website. This task was assumed to require 0.5 hours per system[95]. It was also assumed that arranging publication of the notice of annual summary report would require 0.25 hours per system and an ongoing capital cost of $292 to $2,000 O&M per report[96]. The capital costs breakdown by community size as follows:

Municipality Size	**O&M/report**
< 10,000	$292
10,000-24,999	$2,000
25,000-49,9999	$2,000
50,000 - 249,9999	$2,000
250,000-499,999	$2,000
500,000-999,9999	$2,000
1,000,000+	$2,000

B.3 CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE PROGRAMS

[92] Based on the CSO ICR estimate for this task (1998).

[93] Based on the CSO ICR capital cost for this task (1998).

[94] The estimate to prepare the report and store and make available to the public are based on the CSO ICR labor estimate for this task (CSO ICR, 1998).

[95] From the CSO ICR, 1998

[96] From the CSO ICR, 1998

FOR MUNICIPAL SANITARY SEWER SYSTEMS

Capacity, Management, Operation, and Maintenance Programs for Municipal Sanitary Sewer Systems is presented in six (6) sections:

(1) GENERAL STANDARDS
(2) MANAGEMENT PROGRAM
(3) OVERFLOW RESPONSE PLAN
(4) SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN
(5) CMOM PROGRAM AUDITS
(6) COMMUNICATIONS

The approach and assumptions for purposes of estimating potential costs to the regulated communities[97] for specific CMOM provisions are set forth below. For each provision, appropriate activities or "steps" associated are described[98], and the derivation of the dollar costs are summarized.

(1) GENERAL STANDARDS: This section sets forth a framework for the purpose and intent of the Capacity, Management, Operations, and Maintenance (CMOM) Programs for Municipal Sanitary Sewer Systems required of the permittee.

Under this section providing a general framework, permitees would be required to:

(i) properly manage, operate and maintain, at all times, all parts of their collection system;
(ii) provide adequate capacity for all flows;
(iii) stop and mitigate the impact of overflows;
(iv) notify parties with potential for exposure to these overflows; and
(v) develop a written summary of their CMOM program.

Only the last element of this provision--develop a written summary of their CMOM program--is "new" and therefore incurs costs, as it requires permitees to develop a summary of their management program and to make it and its audit available to the public on request.

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[97]The terms "Systems", "Municipalities" and "Communities" are used here equivalent to and to refer to permitees of municipal sanitary sewer systems. It is expressly recognized that frequently permitees are independent authorities with governing powers different from those of municipalities.
[98]The assumptions set forth here do not necessarily represent a final Agency determination of what actions would be deemed to constitute an adequate CMOM program for any individual community. Because permit conditions and enforcement actions are under jurisdiction of a permitting authority, the steps and estimates provided are for EA costing purposes only.

Develop a Written Summary of CMOM Program

Actions Required–To comply with the proposed element under General Standards, permitees would be required to prepare a written summary of their CMOM program. Permitees would also be required to modify the written summary to address changes in local conditions or procedures.

Assumptions–The start-up costs of complying with proposed Summary of CMOM Program were based on the assumption that between 72 and 176 labor hours[10] would be required to develop and complete the summary. It was assumed that 33%[11] of communities with populations of less than 25,000 would be required to complete the summary, while all communities of 25,000 and greater would prepare the summary. The labor hour estimates were scaled by community size in the following manner:

Municipality Size	Labor Hour Estimate
< 10,000	72-88 (80)
10,000-24,999	88-104 (96)
25,000-49,9999	104-120 (112)
50,000 - 249,9999	120-136 (128)
250,000-499,999	136-152 (144)
500,000-999,9999	152-168 (160)
1,000,000+	168-184 (176)

[10] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. The estimate for this task assumed that the 250 hour average for the *POTW Pretreatment Program Modification Approval Request* is for a community of 50,000 people. For EA costing purposes, it was assumed that this estimate would range from 144-366 hours based on the population size. For example, the 250 hour estimate was assumed to encompass the following CMOM activities: Provide written summary of CMOM management program, identify elements not applicable to your system, identify goals, identify administrative and maintenance positions, identify chain of communication, and implementing pretreatment program prohibitions. It was assumed that implementing pretreatment provisions would require similar hours as 'control I/I' (40 hours for communities of 50,000-250,000). The labor hours for implementing pretreatment provisions were then subtracted from the total (i.e..250 hours - 40 hours = 210 hours) and the hours were divided among the remaining CMOM elements encompassed by this assumption. It was assumed that approximately 52% of the remaining hours (i.e.. 52% of 210 = 130 hours) would be used for this element.

[11] Estimate of the number of communities with capacity related SSOs by Kevin Weiss, EPA Office of Water.

MANAGEMENT PROGRAM:

The CMOM program must be developed in accord with the General Standards, and more specifically, address the following framework:

(i) Goals - specific program goals
(ii) Organization - responsibilities for administration and maintenance
(iii) Legal Authority - legal instruments to address I/I; design, construction and installation; satellites; and pretreatment
(iv) Measures and Activities - implementation of required management measures identification of design and performance provisions
(v) Monitoring, Measurement and Program Modifications

Within the Management Program framework, specific provisions have been identified as new requirements.. Consistent with this section, only those new provisions of the Management Program which incur associated costs are described below.

Actions appropriate to respond to new elements in section (i) through (v) of the proposed Management Program are further described below.

The costing for the section on the Management Program recognizes that those provisions are not applicable in their entirety to all permitees. Permitees responding to the CMOM program requirements may identify provisions that are not "appropriate or applicable" for their program, and explain the justification for their omission in the program summary. The steps below therefore are developed as appropriate to the collection system, and the costing of provisions assumes that many communities may opt not to implement some of the CMOM program provisions they justify as not applicable to their system. Factors such as the size and complexity of the system might affect a permittee's justification that a provision is not appropriate for inclusion in their CMOM.

A separate factor that affects the national sum of the costing is the "industry practice" factor described in the introduction on assumptions and methodology. Similarly, as a result of this provision's flexibility, projected cost impacts of the proposed CMOM provisions could vary widely. Where a range of potential costs reflects those variables, the higher cost end of the range was selected.

Identify those provisions not applicable to the system - In accordance with the provisions that the program should be crafted as "appropriate and applicable to the system", the permittees will identify and justify which elements are not applicable and therefore need not be presented in the CMOM program.

Assumptions - It is assumed that between eight and 32 hours[12] will be necessary to identify those provisions not applicable to the system. The labor hour estimates are provided in the following table.

Municipality Size	Labor Hour Estimate
< 10,000	6-10 (8)
10,000-24,999	10-14 (12)
25,000-49,9999	14-18 (16)
50,000 - 249,9999	18-22 (20)
250,000-499,999	22-26 (24)
500,000-999,9999	26-30 (28)
1,000,000+	30-34 (32)

Goals - The CMOM program must identify with specificity the major goals of the permitee's CMOM program, consistent with the General Standards.

Actions Required –Permitees must have a good grasp of the way the CMOM program as a whole is integrated, and be able to reflect this understanding in their goals, modified for their specific plan. This element thereby also accounts for a certain amount of effort to familiarize the municipal staff with the new CMOM program.

Assumptions - It is assumed that between eight and 32 hours[13] will be necessary to understand the CMOM program and articulate it into appropriate system-specific goals. The following distribution of hours by community size was assumed to be required to complete this task.

[12] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

[13] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

Municipality Size	Labor Hour Estimate
< 10,000	6-10 (8)
10,000-24,999	10-14 (12)
25,000-49,9999	14-18 (16)
50,000 - 249,9999	18-22 (20)
250,000-499,999	22-26 (24)
500,000-999,9999	26-30 (28)
1,000,000+	30-34 (32)

Organization - Permittees must identify in their CMOM Program the responsible administrative and maintenance positions and the lines of authority; and the chain of communication for reporting SSOs.

Identify Administrative and Maintenance Positions

Actions Required –Permitees must establish these new CMOM organizational responsibilities and reflect them in an organizational chart for submission in the CMOM Program Summary.

Assumptions - Between eight and 24 hours[14] per system is allowed for this provision in recognition that identifying key responsible positions and revising established job descriptions can be time consuming.

Municipality Size	Labor Hour Estimate
< 10,000	6-10 (8)
10,000-24,999	10-14 (12)
25,000-49,9999	14-18 (16)
50,000 - 249,9999	18-22 (20)
250,000-499,999	22-26 (24)
500,000-999,9999	26-30 (28)
1,000,000+	30-34 (32)

[14] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

Identify Chain of Communications

Actions Required – Permitees must establish a responsible chain of communication in reporting SSOs.

Assumptions - A clear chain of communication requires assigning responsibility to each person in the chain to ensure compliance with the reporting requirements. Thus, for this provision, between eight and 32 hours per system has been allowed[15].

Municipality Size	Labor Hour Estimate
< 10,000	6-10 (8)
10,000-24,999	10-14 (12)
25,000-49,9999	14-18 (16)
50,000 - 249,9999	18-22 (20)
250,000-499,999	22-26 (24)
500,000-999,9999	26-30 (28)
1,000,000+	30-34 (32)

Include Legal Authority: The Program must include new Ordinances and Agreements to:

(i) control infiltration and connections from inflow sources;
(ii) to require that (non-municipal entities) properly design and construct sewers and connections;
(iii) to ensure that new and rehabilitated sewers are correctly installed, tested, and inspected; (iv) t o a d d r e s s

[15] Derived from *Revision of the Information Collection Request for the National Pretreatment Program* (40 CFR part 403), August 12, 1996, EPA Office of Water. See footnote 7 for additional details.

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Actions Required–The municipalities needing to enact sewer ordinances and agreements would perform the following actions *for each necessary agreement or ordinance* :

(i) review the proposed SSO rule against existing legal authorities for necessary provisions to address;
(ii) prepare draft ordinances and agreements, including internal review by the municipal agency (including attorneys) that will administer the ordinance/agreement;
(iii) negotiate agreements with the satellites;
(iv) introduce the draft ordinance at a municipal council/board meeting;
(v) hold public hearings to provide the public and interested parties an opportunity to comment;
(vi) adopt and enact the agreements and ordinances and enforce the ordinance.

Enforcement activities on the part of the municipality for proper design, installation and testing would consist of reviewing all non-municipal plans for new sewers and connections to treatment works for inclusion of the engineer's seal ensuring proper design and construction; onsite review of installation, testing, and inspection; and onsite review of the necessary measures taken to meet national pretreatment standards.

Assumptions– First, it was assumed that a percentage[16] of communities have already implemented the provision to Include Legal Authority to control I/I and address flows from satellite municipal collection systems. This percentage was scaled by population category as identified below:

Municipality	**% Industry**
< 10,000	10
10,000-24,999	15
25,000-49,9999	50
50,000 -	60

[16] Letter of record, Northern Virginia Planning District Commission, March 2000

250,000-499,999	75
500,000-	75
1,000,000+	75

As part of this provision, it was assumed that municipal and wastewater personnel would need to review the SSO rule, develop a draft agreement or ordinance, submit the ordinance for internal review, support the introduction of the ordinance before the municipal council and to participate in any public hearings. These actions apply to all of the provisions of the section on Legal Authority. Many of the provisions under this section can be brought forth or implemented together to reduce the cost of an individual provision. However, for costing purposes, a unit cost per ordinance or agreement was assumed for each provision under Legal Authority. In addition, it was assumed that the number of ordinances or agreements would vary by provision and population category.

Control I/I

Actions Required **-** As discussed above, the actions required under this provision include: develop a draft agreement or ordinance; submit the agreement or ordinance for internal review; in the case of agreements, negotiate with the satellites subject to the agreement; support the introduction of the ordinance before the municipal council; and to participate in any public hearings.

Assumptions– The number of hours per agreement ranges from 40 to 76 (scaled by community size), with the number of agreements per municipality ranging from 1 to 5 as identified below[17]:

Municipality	**Hours per Ordinance or Agreement**
< 10,000	37-43 (40)
10,000-24,999	43-49 (46)
25,000-49,9999	49-55 (52)
50,000 -	55-61 (58)
250,000-499,999	61-67 (64)
500,000-	67-73 (70)
1,000,000+	73-79 (76)

[17] Both the number of hours and number of agreements per municipality from Letter of record, Northern Virginia Planning District Commission, March 2000.

Municipality Size	No. of Ordinances or
< 10,000	1
10,000-24,999	2
25,000-49,9999	3
50,000 - 249,9999	5
250,000-499,999	5
500,000-999,9999	5
1,000,000+	5

Address Flows from Municipal Satellites:

Actions Required - As with the other Legal Authority requirements, the actions required under this provision include: develop a draft agreement; submit the agreement for internal review; support the introduction of the ordinance before the municipal council and to participate in any public hearings.

Assumptions– The number of hours per agreement ranges from 10 to 64 (scaled by community size), with one to five agreements per municipality as identified below[18]:

Municipality Size	Hours/Ordinance or
< 10,000	5-15 (10)
10,000-24,999	15 -25 (20)
25,000-49,9999	25 -35 (30)
50,000 - 249,9999	35 -45 (40)
250,000-499,999	45-55 (50)
500,000-999,9999	55-65 (60)
1,000,000+	65-75 (70)

Municipality Size	No .of Ordinances or agreements per Municipality

[18] Both the number of hours and number of agreements per municipality from Letter of record, Northern Virginia Planning District Commission, March 2000.

< 10,000	1
10,000-24,999	2
25,000-49,9999	3
50,000 - 249,9999	5
250,000-499,999	5
500,000-999,9999	5
1,000,000+	5

CMOM Measures and Activities

Actions Required – In the introduction to this provision, municipalities are required to identify the person or position responsible for each sub-element under this provision.

Assumptions– To implement this requirement, it was assumed that 2-8[19] labor hours would be required to identify the appropriate person or position for each element of this provision.

Municipality Size	**Labor Hours**
< 10,000	1.5 -2.5 (2)
10,000-24,999	2.5 -3.5 (3)
25,000-49,999	3.5 -4.5 (4)
50,000 - 249,9999	4.5-5.5 (5)
250,000-499,999	5.5 - 6.5 (6)
500,000-999,9999	6.5 - 7.5 (7)
1,000,000+	7.5 - 8.5 (8)

Maintain a map - The requirement to maintain a map as one of the new CMOM 'Measures and Activities' is key to effectively conducting a range of other activities, such as proper O&M, capacity evaluation, and addressing hydraulic deficiencies.

Actions Required: The new regulatory requirement to maintain a map is stated simply, and the details of

[19] Personal communication with Rick Arbour, California State University (2000)

what format, scale, etc. is left to the judgement of the permittee. According to the Agency[20], the map record requirement could be met by the design drawings that are routinely kept on file–it is only newly required that these files be maintained from the date of the rule. The adequacy of the map would be judged under the existing requirement to prevent discharges, so (routine) information must be managed so as to perform this existing duty.

Assumptions: Because of the extreme variability within the industry as to the types of maps maintained and created–and the associated variation in costs-- an investigation was made of the range of most common approaches, from maintaining design files to creating new sophisticated GIS systems. The literature review[21] and all industry interviews indicated that, at a minimum, all sanitary sewer managers keep design and/or as-built drawings on file, and may create paper maps in an atlas for use in routine O&M activities. As a result, the conclusion was drawn that the industry is already in compliance with this new requirement to maintain a map, and therefore there are no new costs.

Management and Use of Information for Prioritizing CMOM Activities and Illustrating Trends in Overflows: would require permitees to management their relevant data and information for proper management of their system, with the emphasis on the purpose to prioritize CMOM activities, and to identify and illustrate trends in overflows.

Because the CMOM program requirements are to be tailored to the size and complexity of a collection system, the system to manage such information is therefore implicitly *not* required to be in electronic (computer-based) form; e.g., databases, modeling tools, etc. The costing assumptions for this provision assume that the information collected under routine operations must be managed in such a way as to permit later use of it. This is not a new requirement, as chronological or categorized file systems would be deemed adequate so long as violations could be avoided using this information.

(However, it is recognized that those permitees subject to the requirements of the section on System Evaluation and Capacity Assurance (those permitees with 'peak flow conditions contributing to an SSO discharge'), would most cost-effectively meet those requirements by developing a computer-based system for those problem areas. Base-level spreadsheet analysis and modeling would be necessary to manage the complexity of the analytical information reviewed in these sections, and the need to integrate this data into an analytical tool. It is assumed that the percent of permitees which because of the small size and complexity of their system do not currently require use of a computer can continue to successfully manage their system to meet the existing prohibition on SSOs.)

Information must also be managed to prioritize CMOM activities (costed under that section).

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[20] Kevin Weiss, USEPA/OWM, 1999

[21] WEF Manual of Practice No. 7 *Wastewater Collection System Practice, 1999*

Actions Required–This provision does not require an electronic or other "information management system", but that routine information must be managed so as to be useful in analysis and decision-making. Whether paper or electronic media is sufficient would be based on the size and complexity of the system and its performance record of SSOs.

Municipalities would need to set up a systematic means of tracking information on SSOs and problem areas, which would be identified through ongoing O&M work orders, logs and records, and CMOM data for any necessary analysis for structural, hydraulic, and capacity deficiencies for priority analyses.

(i) Identifying and Illustrating trends in overflow occurrences

Assumptions– It was assumed that 'start-up' for identifying and illustrating trends in overflows would require between 40 and 64[22] hours of time for municipal employees.

Start-up costs for using timely, relevant information to establish and prioritize appropriate CMOM activities were likewise assumed to range from 40 to 64[23] hours. The following breakdown was assumed for both tasks associated with this provision:

Municipality Size	Labor Hours
< 10,000	38 - 42 (40)
10,000-24,999	42-46 (44)
25,000-49,9999	46 -50 (48)
50,000 - 249,9999	50 - 54 (52)
250,000-499,999	54 -58 (56)
500,000-999,9999	58-62 (60)
1,000,000+	62-66 (64)

Ongoing costs for using timely, relevant information to prioritize appropriate CMOM activities were estimated at 2-14[24] hours per year scaled for community size. Identifying and illustrating trends in overflows would likewise require between 2 and 14[25] hours per year. The breakdown of ongoing labor hours by

[22] Personal communication with Rick Arbour, California State University (2000)
[23] Personal communication with Rick Arbour, California State University (2000)
[24] Personal communication with Rick Arbour, California State University (2000)
[25] Personal communication with Rick Arbour, California State University (2000)

community size for these two provisions is as follows:

Municipality Size	Labor Hours/Year
< 10,000	1-3 (2)
10,000-24,999	3-5 (4)
25,000-49,9999	5-7 (6)
50,000 - 249,9999	7-9 (8)
250,000-499,999	9-11 (10)
500,000-999,9999	11-13 (12)
1,000,000+	13-15 (14)

Current Capacity Assessment

Actions Required– This task assumes that permanent flow monitors are installed at the outflow of sewer sub-basins. Through this data record, the utility manager will determine the priority basins to assess capacity in greater detail. Based on previous routine inspection records during routine O&M, the pipe material, age, and condition will be on record. Design flows will be on record as part of the calculations from the sewer design submittals. On a rolling schedule of 20% of the system per year, the utility manager would place three flow monitors at branching points upstream of problem areas (those which might have hydraulic deficiencies (see the Section on System Capacity Evaluation). This data record will be plotted and tracked against the design flow of that section of the system as installed. The comparison of these actual flow records to the design flow would indicate excess flow.

Assumptions– The costing of this task assumes that:

(i) 25% of system miles have problem areas (using the Pareto rule);
(ii) there is a record of 75 overflow points/1000 miles (which includes SSO 'events');
(iii) the activity would be conducted on a rolling schedule of 20% problem areas per year;
(iv) two monitoring points per overflow points would be necessary[26];
(v) A typical pipe diameter of 24 inches;

[26] WEF, 1999

(vi) Flow Meter purchase cost of $4,000 per meter[27];
(vii) Installation of $540 per meter per manhole[28];
(viii) $45 per meter weekly data downloading costs[29];
(ix) Manhole entry required every 3 months at each meter[30];
(x) 4 hours/month for data reporting/summary[31].

Identify/Prioritize Structural Deficiencies and Rehabilitation Actions for Each Deficiency - would require permitees to identify and prioritize structural and hydraulic deficiencies and identify and implement short-term and long-term rehabilitation actions to address each deficiency.

This activity is consistent with the CMOM Program's emphasis on prioritization to address problem areas.

The costing for this element assumes that the information to be provided under this section could require sanitary sewer system analyses using electronic data management techniques. The need for these techniques would depend on the size of the data set to be analyzed and the reasonable professional ability of human resources to cost-effectively perform such analyses without computers.

Actions Required– Municipalities would have to allocate labor hours for revising or preparing rehabilitation plans to highlight problem areas for prioritization.

Assumptions–Revising rehabilitation plans to highlight problem areas for prioritization would require between 16 and 40 labor hours[32] at start-up. Ongoing costs to perform to revise rehabilitation plans to highlight problems areas would require between 8 and 40 labor hours/year[33]. The percent of

[27] Quote from American Sigma, 1999

[28] Installation costs based on 1999 project data at Niagra Falls, NY. This costs assumes: standard OSHA confined space entry procedures; 1.75 hours per meter installation/entry, including probe/band assembly and calibration, four gas meter w/ calibration gas rental confined space entry tripod, harness and ladder, company truck, 3 man crew for installation, misc. supplies,. manhole puller, flashlight, duct tape, traffic control, and laptop computer.

[29] Weekly download costs for Technician, vehicle, computer for 0.5 hours per meter

[30] Periodic maintenance is required due to probe clogging, equipment malfunctions, bands loosening, etc. Generally requires three man crew with entry every 3 months to maintain equipment.

[31] Four hours per month have been assumed for data reporting and summary generation.

[32] Personal communication with Dave Irvin, PHRA

[33] Personal communication with Dave Irvin, PHRA

communities implementing this element was taken to be 92% for all community sizes[34]. The following assumptions were made regarding the breakdown in hours required for start-up and ongoing costs:

Municipality Size	Start-Up Labor Hours
< 10,000	12-20 (16)
10,000-24,999	20-28 (24)
25,000-49,9999	28-36 (32)
50,000 - 249,9999	36-44 (40)
250,000-499,999	44-52 (48)
500,000-999,9999	52-60 (56)
1,000,000+	60-68 (64)

Municipality Size	Ongoing Labors Hours
< 10,000	4-12 (8)
10,000-24,999	12-20 (16)
25,000-49,9999	20-28 (24)
50,000 - 249,9999	28-36 (32)
250,000-499,999	36-44 (40)
500,000-999,9999	44-52 (48)
1,000,000+	52-60 (56)

Training: would require permittees to ensure that their employees and other appropriate parties are properly trained, including refresher training, on safe procedures and the implementation of the permittee's CMOM management program.

Actions Required–To implement this requirement in the context of the new CMOM Program, small municipalities will either need to develop an in-house training program or to train wastewater personnel using outside consultants.

[34] This estimate is based on the percentage of systems with an established procedure for problem evaluation and solution from Arbour and Kerri, 1998

Assumptions–It was estimated that wastewater personnel would need four hours of management plan training and four hours of 'other' training. Training costs were estimated at $20.34[35] per hour with a 28-hour training requirement.[36] Refresher training for ongoing costs assumed training costs at 50% that of the original training. It was assumed that 100% of staff for communities less than 250,000 would need training, while 50% of the staff for municipalities greater than 250,000 would be trained[37].

The number of personnel requiring training was assumed to vary by municipality size as follows:

Municipality Size	No. of Persons Trained
< 10,000	2.0
10,000-24,999	5.5
25,000-49,9999	3.4
50,000 - 249,9999	16.2
250,000-499,999	17.1
500,000-999,9999	46.2
1,000,000+	71.3

DESIGN AND PERFORMANCE PROVISIONS

Establish Design Standards

Actions Required– Municipalities would be required to establish requirements and standards for the installation of new sewers, pumps and other appurtenances, and rehabilitation and repair projects. This would involve drafting an ordinance and attending public hearings related to the design and performance provisions.

Assumptions- Many municipalities already have requirements and standards for the installation of new

[35] Training cost per hour estimate for on-site confined space entry training quote provided by All-American Environmental Services assuming a class size of 6 people, 1998.

[36] Collection systems training time estimated to range from 2 to 5 days by Arbour and Kerri, 1998. Thus, the midpoint (28 hours) was used as an estimate of the typical labor burden required by this element.

[37] The number of collection system personnel from WEF Survey Database, 1997.

sewers. It was estimated that between 55% of communities already have such an ordinance[38]. Drafting the ordinance was assumed to take 12 to 24 hours, while holding public hearings would take between 8 and 56 hours[39]. The hours break down as follows:

Municipality Size	**Drafting Ordinance Start-Up Labor Hours**
< 10,000	11-13 (12)
10,000-24,999	13-15 (14)
25,000-49,9999	15-17 (16)
50,000 - 249,9999	17-19 (18)
250,000-499,999	19-21 (20)
500,000-999,9999	21-23 (22)
1,000,000+	23-25 (24)

Municipality Size	**Public Hearings Ongoing**
< 10,000	4-12 (8)
10,000-24,999	12-20 (16)
25,000-49,9999	20-28 (24)
50,000 - 249,9999	28-36 (32)
250,000-499,999	36-44 (40)
500,000-999,9999	44-52 (48)
1,000,000+	52-60 (56)

Establish Procedures and Specifications for Inspection/Testing

Actions Required– The actions required for this provision would be nearly identical to those required to establish requirements and standards for the installation of new sewers. Municipalities would be

[38] From *Review of Design Standards/Criteria for Sizing Sanitary Sewers*, USEPA, Draft from Parsons ES (2000)

[39] Letter of record, Northern Virginia Planning District Commission, March 2000

required to establish provisions and specifications for inspecting and testing the installation new sewers, pumps, and other appurtenances and for rehabilitation and repair projects. This would involve drafting an ordinance and preparing for public hearings.

Assumptions-It is estimated that between 55% of municipalities already have such provisions and specifications[40]. The tasks and estimate of hours follows closely with those required to establish requirements and standards for the installation of new sewers. The breakdown of assumptions by community size is as follows:

Monitor, Measure, Update CMOM Program and Summary

Actions Required– The actions required for this provision include monitoring implementation and measuring performance of the CMOM program. Special emphasis is placed on this element and its costing, as the intent of the Agency is to acknowledge the utilities' professionalism, judgement, and responsibility to manage the collection system effectively. In accordance with this principle, ongoing costs were allocated to dedicate to continuous program evaluation and revision so as to target available resources most cost-effectively.

Assumptions- As an ongoing activity, monitoring implementation of the CMOM program would require 2% of the cost of the Management Program.[41]

OVERFLOW RESPONSE PLANS

This provision would require permitees to develop and implement an Overflow Response Plan describing procedures to stop and mitigate overflows, and ensure persons are notified with potential for exposure. Specific elements include ensuring appropriate response to an overflow, working with health, NPDES, and other appropriate officials (e.g., drinking water, recreational waters) to develop criteria for appropriate notification of those health and NPDES officials, and notifying the public as an impact mitigation step in their procedures for responding to overflows.

Cost estimates reflecting data collection, plan preparation, and drafting were included in the estimated Overflow Response Plan costs. However, actual public and health official notification procedures are addressed in section in Record-keeping and Reporting.

Actions Required–A model sewer overflow response plan (SORP) on diskette is available from the

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[40] From *Review of Design Standards/Criteria for Sizing Sanitary Sewers*, USEPA, Draft from Parsons ES (2000)

[41] Nexus Associates (2000)

American Public Works Association1. Municipalities needing to develop a SORP may either purchase the model SORP or hire a consultant to develop a SORP tailored to the municipality. Municipalities hiring a consultant will need to allocate wastewater personnel to oversee the development of the tailored SORP.

Assumptions–Some municipalities may already have an adequate SORP in place. Recent references on collection system metrics indicate an industry practice of 38%[42]. The following assumptions were made about the distribution of municipalities needing to implement a SORP and how they will accomplish this need.

Municipality Size	Need to Implement SORP	Will Implement a Tailored SORP
< 10,000	38%	0%
10,000-24,999	38%	25%
25,000-49,999	38%	50%
50,000-249,999	38%	75%
249,999-500,000	38%	75%
500,000-999,9999	38%	75%
1,000,000+	38%	75%

A tailored SORP developed by a consultant was estimated to cost $25,000[43]. The model SORP costs $65[44] and would require eight labor hours for implementation.

Ensure Personnel are Aware and Trained in the Overflow Response Plan:

Actions Required– Permitees would be required provide overflow response training to O&M staff.

Assumptions–It was estimated that about 38% [45] of municipalities currently provide such general training for their O&M staff (Arbour and Kerri, 1998). The training cost assumptions s reflect the

[42] Survey data by Arbour and Kerri (1998) indicating percentage of respondents documenting the existence of established written procedures for containing and evaluating overflows.

[43] Estimate based on discussions with AWPA SSO Focus Group members (1999).

[44] The APWA cost for the model SORP (including diskette) to non-APWA members is $65.

[45] Survey data by Arbour and Kerri, 1998 indicating percentage of respondents documenting the existence of established written procedures for containing and evaluating overflows.

assumptions provided in the CMOM section on Training. That is, training costs were estimated at $20.34[46] per hour and it was assumed that wastewater personnel would need 28 hours[47] of overflow response training. The number of personnel requiring training was assumed to be 100% for communities less than 250,000 and 50% for communities greater than 250,000. The number of O&M staff requiring training varies by municipality size as follows:

Municipality Size	No. of Persons Trained
< 10,000	2.0
10,000-24,999	5.5
25,000-49,9999	3.4
50,000 - 249,9999	16.2
250,000-499,999	17.1
500,000-999,9999	46.2
1,000,000+	71.3

SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN: would require permittees to

Actions Required–Municipalities implementing this section would have to prepare a capacity evaluation and quality assurance plan if peak flow conditions are contributing to an SSO discharge, *unless* they have either already taken steps to correct the hydraulic deficiency, or is caused by severe natural conditions. Once the problem areas are identified under the requirement to identify trends in overflows, the permittee must develop estimates of peak flows associated with conditions similar to those causing overflow events, provide estimates of the capacity of key system components, identify hydraulic deficiencies, and identify the major sources that contribute to the peak flow associated with overflow events.

Assumptions–The following hours were assumed [48]as a start-up cost for preparing a system evaluation

[46] Training cost per hour estimate for on-site confined space entry training quote provided by All-American Environmental Services assuming a class size of 6 people.

[47] Arbour and Kerri, 1998

[48] It was assumed that the labor required for this task would be similar to of CMOM program audits. The labor estimate for conducting CMOM progam audits is based on personal communication with Rick Arbour.

and capacity assurance plan. It was assumed that 33%[49] of the communities had capacity related SSOs, or "problem areas", requiring analysis of hydraulic deficiencies, and that those problem areas were focused in 25% of those systems (using the Pareto Rule). It was assumed that 31%[50] of communities currently had system evaluation and capacity assurance plans.

Municipality Size	Prepare Plan (hours)
< 10,000	36-44 (40)
10,000-24,999	44-52 (48)
25,000-49,999	52-60 (56)
50,000-249,999	60-68 (64)
249,999-500,000	68-76 (72)
500,000-999,9999	76-84 (80)
1,000,000+	84-90 (88)

Establish Capacity Enhancement Measures (Prioritization, Alternatives, Schedule):

Actions Required - Establishing capacity enhancement measures relies heavily on the data from work conducted as part of normal utility operations, and from new data gathering and analysis efforts under the proposed CMOM rule. Routine operation and maintenance activities will provide inspection logs during which the permitee records condition assessment, and maintenance of a map is key for characterizing problem areas. Activities required under previous provisions of CMOM will provide current capacity assessment, identification of structural deficiencies, and the first clarification under this section--evaluate hydraulic deficiencies for problem areas.

Using these data, the utility manager can prioritize problem areas (using, for example, the sensitivity of waters outlined in the section on 'prioritizing CMOM activities').

Assumptions–It was assumed that 16.4%[51] of the industry already performs the provisions under this section (in all population categories). It was also assumed, using the Pareto rule, that problem areas are

[49] Estimate by Kevin Weiss, EPA Office of Water

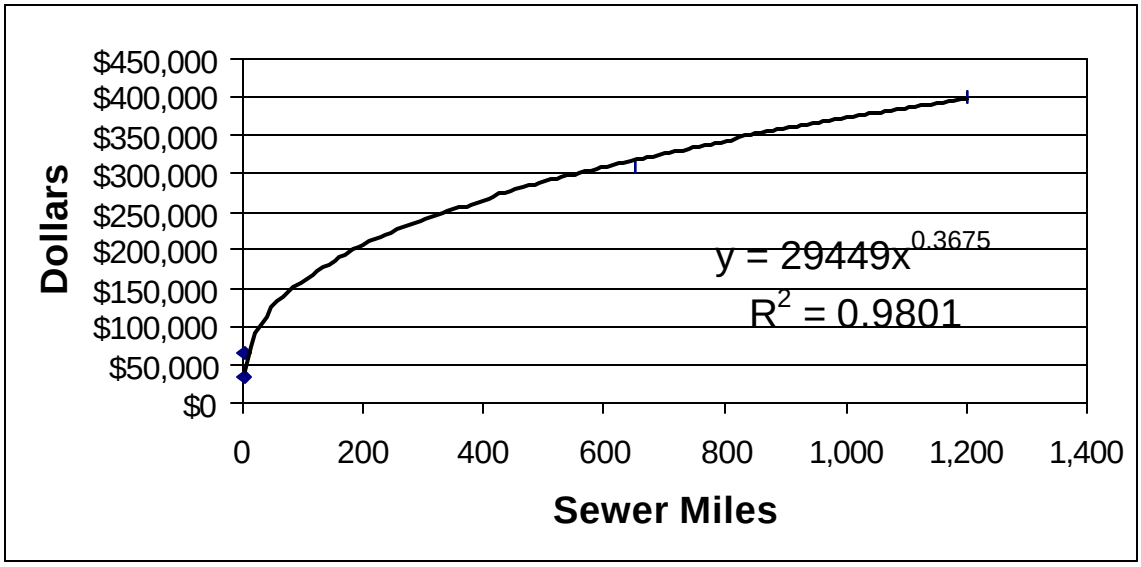
[50] Based on the percentage of communities having an established procedure for problem evaluation and solution from Arbour and Kerri (1998).

[51] *Optimization of Collection System Maintenance Frequencies and System Performance* (ASCE, 1998)

found in 25% of system length.

Costs for this start-up activity have been estimated from a cost curve developed for this element[52]. The cost curve takes the form of :

Cost = $54,663*Ln(Sewer Length (miles)- $ 8,751



Plan Updates: This element provides for revising the System Evaluation and Capacity Assurance Plan as activities are implement and new data is collected.

Actions Required– Once the Plan is in place, the municipal system staff must periodically articulate how it has changed to best represent current status. The labor hours provided are for revising appropriate sections of the Plan.

Assumptions– The labor hours required for this ongoing cost are summarized as follows:

Municipality Size	Plan Updates (hours/year)

[52] Cost curve developed from project work in the Mid-Atlantic region between 1995 and 1999. Personal communication with Peer Consultants (2000).

< 10,000	7-9 (8)
10,000-24,999	9-11 (10)
25,000-49,999	11-13 (12)
50,000-249,999	13-15 (14)
249,999-500,000	15-17 (16)
500,000-999,9999	17-19 (18)
1,000,000+	19-21 (20)

CMOM PROGRAM AUDITS: would require permitees to conduct compliance audits, beginning with a baseline audit on permit issuance under CMOM, and then every five years, to evaluate their implementation of the CMOM requirements. The baseline audit required in the start-up year, soon after permit issuance, should identify strengths and deficiencies in the municipality's existing program as compared to the new requirements.

Lacking specific language requiring an external audit, an internal audit is assumed (it should be noted that an audit conducted by a consultant is still an 'internal', rather than independent or EPA-sponsored audit.) Costing allows for an audit prepared by a consultant, as they are more likely to have the necessary expertise as to regulatory expectations, recent case law, and communities appropriate for comparison.

The audit would be based on interviews with facility managers, field inspection of equipment and other resources, interviews with field personnel and first level supervisors, observation of field crews, and reviews of pertinent records and information management.

The written report of the audit must include the following:

(i) all findings, including work yet to be done in the ongoing program;
(ii) steps taken to respond to each finding, including steps taken to correct deficiencies;
(iii) a schedule for implementing any response to the findings of the audit.

Actions Required–To comply with these proposed requirements, permitees (or their consultants) would conduct interviews and evaluate the following program provisions:

(i) maintenance facilities, equipment, and spare parts
(ii) legal authorities (e.g., sewer ordinances)
(iii) management systems
(iv) current physical conditions
(v) routine operations and maintenance activities

(vi) installation, testing, and inspection procedures
(vii) overflow response, emergency operations, and the overflow response plan
(viii) programs for identifying and prioritizing structural and hydraulic deficiencies
(ix) programs for optimizing treatment facilities
(x) employee training

Permittees also would be required to prepare a written audit report.

Assumptions–A baseline audit is reflected in the Start-up costs. The design life of an audit, or its schedule for recurring, is five years. Ongoing costs to review and revise the audit, for subsequent years, are assumed to be 20% of the first audit in the start-up year.

It was assumed that the municipality would require between 20 and 80 hours to perform a CMOM program audit and prepare a report[53]. The time was divided as follows:

Municipality Size	Conduct Audit (hours)
< 10,000	15-25 (20)
10,000-24,999	25-35 (30)
25,000-49,999	35-45 (40)
50,000-249,999	45-55 (50)
249,999-500,000	55-65 (60)
500,000-999,9999	65-75 (70)
1,000,000+	75 -85 (80)

COMMUNICATIONS

Actions Required– Municipalities must provide for routine communications with interested parties, including the general public, as well as, for example, departments of public health, environmental advocacy groups, drinking water utilities, and recreational water interests (e.g., tourism offices). The topic of Communications should also include a plan for public notice and reporting as costed and described in 122.42 (h).

Assumptions–Most utilities already use public outreach materials such as newsletters and, where appropriate, websites. The Public Information Officer also is assumed to have an address list of interested parties (in addition to its ratepayers) who have asked to be kept apprized of specific matters

[53] Personal communication with Rick Arbour, California State University (2000)

such as spills, but that that list might be somewhat expanded under this new requirement. These routine communications add minimal additional costs to the existing communication with interested parties. This element has been costed at $0.03/per person.[54]

B.5 MUNICIPAL SATELLITE SEWER COLLECTION SYSTEMS

Permit Requirement - Municipal satellite sewer collection systems are point sources subject to the NPDES program.

Duty to Apply

Actions Required–Municipal satellite sewer collection systems would be required to apply for a permit either under notice of intent (NOI) for a general permit, or a full permit application.

Assumptions–It was assumed that 90% of permittees will prepare a NOI under the general permit, a task that would involve 2 labor hours/system. The other 10% of permittees would prepare a full permit application. The full permit application would require 5 labor hours per system.

[54] Communications costs from the Storm Water Phase II Economic Analysis (1999), scaled down to eliminate volunteer monitoring.

APPENDIX C Detailed Cost Tables by Provision and by Community Size

[INSERT EXCEL FILE "APPENDIX C.XLS"]