

ECONOMIC INFEASIBILITY AND EPA'S 1994 COMBINED SEWER OVERFLOW POLICY: A SUCCESSFUL SOLUTION IN MASSACHUSETTS STILL LEAVES A TURBID UNDERSTANDING BETWEEN STATE AND FEDERAL OFFICIALS

*Jeff Mann**

Combined Sewer Overflows (CSOs) are the repugnant remnants of antiquated technology that plague older cities like Boston and threaten precious water resources like the Charles River by introducing raw sewage during wet- weather events. Solving the CSO problem means tearing up many of the streets and replacing decades-old pipes or boring large underground storage basins to contain these flows. The Massachusetts Water Resources Authority (MWRA), the largest supplier of water and sewer services in Massachusetts, developed a plan to reduce untreated CSO discharge volumes into Boston Harbor and its tributaries by ninety-two percent, including treatment of ninety-two percent of all continuing CSO discharges. This plan came as an alternative to spending over \$1 billion for a tunneled stormwater collection system. The Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP) concluded that MWRA's plan was sufficient given that requiring these additional measures would have a substantial economic impact on the community. However, these agencies remain at odds over how that impact should be calculated—based on a cost-effectiveness analysis or on an ability to pay.

INTRODUCTION

The Massachusetts Water Resources Authority (MWRA) provides sewer and water services to sixty-one Massachusetts communities, serves 2.5 million people and over 5000 businesses, supplies 255 mil-

* Clinical Placement Director and Articles Editor, BOSTON COLLEGE ENVIRONMENTAL AFFAIRS LAW REVIEW, 1998-1999.

lion gallons of drinking water a day, and treats 370 million gallons of sewage.¹

Throughout MWRA's sewage collection system are Combined Sewer Systems (CSSs).² CSSs are wastewater systems that carry sewer drainage from commercial and residential sources and collect runoff from stormwater and snow-melt events.³ Typically, these systems transport all of their sewage to a centralized treatment plant, such as MWRA's facility at Deer Island.⁴ These facilities, known as Publicly Owned Treatment Works (POTWs),⁵ are often designed to handle tremendous amounts of combined flows, even in wet weather.⁶ However, the CSS piping networks are widespread and have not been upgraded to match the capacities of the POTWs.⁷ As a result, areas such as eastern Massachusetts that have invested billions of dollars in new POTWs still lack adequate sewer piping capacity to transport both daily sewage flows and additional flows from wet-weather events.⁸ When such overcharge occurs, the systems utilize overflow discharge points called Combined Sewer Overflows (CSOs).⁹

¹ See MWRA, *MWRA's Essential Statistics* (visited Jan. 31, 1999) <<http://www.mwra.com/org/html/whatis.htm>>. Treatment quantities represent an average and fluctuate with weather and demographic changes. See *id.*

² See MWRA, FINAL COMBINED SEWER OVERFLOW FACILITIES PLAN AND ENVIRONMENTAL IMPACT REPORT 2-1 (1997) [hereinafter MWRA FEIR].

³ See TERENCE J. MCGHEE, *WATER SUPPLY AND SEWAGE* 266 (6th ed. 1991).

⁴ See MWRA, *Combined Sewer Overflows* (visited Feb. 25, 1999) <<http://www.mwra.com/sewer/html/sewco.htm>> [hereinafter *Combined Sewer Overflows*].

⁵ See 40 C.F.R. § 403.3(o) (1999).

⁶ See Kevin B. Smith, *Combined Sewer Overflows and Sanitary Sewer Overflows: EPA's Regulatory Approach and Policy under the Federal Water Pollution Control Act*, 26 *Env'tl. L. Rep.* (Env'tl. L. Inst.) 10,296 (June 1996); see, e.g., MWRA, *Deer Island Sewage Treatment Plant* (visited Feb. 25, 1999) <<http://www.mwra.com/sewer/html/sewditp.htm>>.

⁷ See *Northwest Env'tl. Assoc. v. City of Portland*, 56 F.3d 979, 981 (9th Cir. 1995), *cert. denied*, 518 U.S. 1018 (1996). For example, in Portland, Oregon the POTW collection system was overcharged with resulting CSOs occurring 50 to 80 times per year. See *id.*

⁸ See *Discharge Permits: Permit for \$3.9 Billion Treatment Plant in Massachusetts Called "Toughest" in U.S.*, 28 *Env't Rep.* (BNA) 2121 (Feb. 13, 1998) (MWRA's POTW cost \$3.9 billion); *Combined Sewer Overflows*, *supra* note 4 (despite increasing the pumping capacity at MWRA's POTW, CSOs still continue). "[CSOs] add the final irony to a picture of a shining new technology [POTWs] resting proudly at the end of a porous delivery system that spills and leaks on the way to the treatment plant." 1 WILLIAM H. RODGERS, JR., *ENVIRONMENTAL LAW AIR AND WATER* 333-34 (1986) [hereinafter RODGERS 1]. Despite cutting emissions by CSOs in half through improvements in primary treatment and collection, the MWRA system still discharged over 1.5 billion gallons of CSOs until 1992. See Nancy J. Wheatly, *The Regulatory Pendulum: Has It Finally Come to Rest for CSO Control?*, in NATIONAL WATER RESOURCES REGULATION: WHERE IS THE ENVIRONMENTAL PENDULUM NOW? 187, 193-94 (Howard Holme ed., 1994).

⁹ See *Combined Sewer Overflow (CSO) Control Policy*, 59 *Fed. Reg.* 18,688, 18,688 (1994); *Combined Sewer Overflows*, *supra* note 4.

CSOs are remnants of obsolete technology that burden older cities like Boston and threaten precious water resources like the Charles River by introducing raw sewage during wet-weather events.¹⁰ Completely solving the CSO problem would require tearing up many streets and replacing decades-old pipes or boring large underground storage basins to contain these flows.¹¹ MWRA, the largest supplier of water and sewer services in Massachusetts, developed a plan to reduce the volume of untreated CSO discharges into Boston Harbor and its tributaries by ninety-two percent, including treatment of ninety-two percent of all continuing CSO discharges.¹² This plan was an alternative to spending over one billion dollars for a tunneled collection system.¹³ EPA and the Massachusetts DEP concluded that MWRA's plan was sufficient given that requiring these additional measures would have a substantial economic impact on the community.¹⁴ However, these agencies remain at odds over how that impact should be calculated—based on a cost-effectiveness analysis or on ability to pay.¹⁵

Since the Clean Water Act (CWA)¹⁶ has not directly addressed CSOs, EPA issued two policies governing how states should handle CSOs in their efforts to meet the federally-mandated water quality and technology standards.¹⁷ Both EPA's most recent CSO policy and the Massachusetts DEP CSO policy—the latter issued in accordance with the former—provide a menu of alternatives for regulating CSOs to help states attain national and state water quality goals and address CSO impacts.¹⁸ One such option is an economic standard that allows states to change designated uses of a water body to reflect wet-weather impacts of CSOs where total elimination would cause "substantial and widespread social and economic impacts."¹⁹

This Comment suggests that the standards for showing a change in designated use should include an analysis of the cost-effectiveness

¹⁰ See MCGHEE, *supra* note 3, at 268.

¹¹ See Smith, *supra* note 6, at 10,296.

¹² See *infra* note 180 and accompanying text.

¹³ See *infra* note 180 and accompanying text.

¹⁴ See *infra* note 135 and accompanying text.

¹⁵ See *infra* notes 179, 231–32, 240–43 and accompanying text.

¹⁶ 33 U.S.C. §§ 1251–1387 (1994).

¹⁷ See 59 Fed. Reg. at 18,688; *National Combined Sewer Overflow Control Strategy*, 54 Fed. Reg. 37,370, 37,371 (1989).

¹⁸ See 59 Fed. Reg. at 18,688, 18,694–95; MASSACHUSETTS DEP, POLICY FOR ABATEMENT OF POLLUTION FROM COMBINED SEWER OVERFLOW 1 (1997) [hereinafter DEP CSO POLICY].

¹⁹ 40 C.F.R. § 131.10(g)(6) (1999); MASS. REGS. CODE tit. 314, § 4.03(4)(f) (1998).

of abating CSOs. Cost-effectiveness allows a permittee to avoid costly improvements that are unlikely to achieve significant water quality benefits. This flexibility frees additional economic resources to address non-CSO pollution sources and more efficiently achieves overall water quality goals.

The health and cost challenges of CSOs are discussed in Section I. A brief explanation of the CWA framework is provided in Section II. Section III discusses the integration of CSOs into the CWA through review and permitting under EPA policies. Section IV outlines the procedure for changing designated uses of receiving water bodies and the options available to EPA and state administrators for continuing CSO discharges. Section V then traces MWRA's application for CSO National Pollution Discharge Elimination System (NPDES) permits. The conclusions and positions of EPA and DEP regarding MWRA's showing of economic impact are then detailed in Section VI along with their respective conclusions of the required economic standards. Finally, Section VII discusses the use of a cost-benefit analysis in environmental decision making and assesses the benefits of cost-effectiveness in addressing these concerns.

I. CSO BACKGROUND

A. *What are CSOs?*

CSOs are byproducts of antiquated engineering and municipal planning.²⁰ To eliminate street accumulation of sewage, early planners combined stormwater collection and sewer transportation.²¹ However, as cities grew, flows of sewage increased and the amount of impervious areas grew, increasing the loading on these networks.²² Unwilling or unable to tear up the streets to replace these outdated pipes, cities developed "blow off points" where the excess pressure head in the system could directly discharge into a water body, easing the pressure on the network and preventing a backup of sewage into the streets and basements of the communities.²³ These discharge events are known as CSOs.²⁴

²⁰ See MCGHEE, *supra* note 3, at 268.

²¹ See *id.*

²² See *id.*

²³ See Smith, *supra* note 6, at 10,296; see also Northwest Env'tl. Assoc. v. City of Portland, 56 F.3d 979, 985 (9th Cir. 1995).

²⁴ See generally Smith, *supra* note 6.

Typically, CSOs receive limited treatment and discharge the mixed stormwater and sewage into public water bodies.²⁵ Untreated, they can pose unsightly and hazardous threats to the environmental health of receiving water bodies.²⁶ CSOs also directly conflict with the goals of the CWA.²⁷

B. Regulatory and Economic Challenges of CSOs

The economic impact of CSO cleanup on communities is clear and predictable: nationwide, CSSs collect the sewage and stormwater in 950 communities, serving forty million people.²⁸ EPA recently estimated that the cost for CSO cleanups will exceed \$40 billion.²⁹ Furthermore, CSOs are essential to the operation of CSS systems and cannot be eliminated overnight.³⁰ Without CSOs, large wet-weather events would cause raw sewage to backup into basements and streets.³¹

Finally, because CSO events depend on variable stormwater or snowmelt conditions, they elude both quantification and qualification, frustrating regulation on a national basis.³² For example, trying to prevent all of the CSOs for a given year may require a facility four times larger than a facility that collected all but four discharges per year.³³ Thus, seventy-five percent of the facility's capacity would be

²⁵ See MCGHEE, *supra* note 3, at 268.

²⁶ See *National Combined Sewer Overflow Control Strategy*, 54 Fed. Reg. 37,370, 37,371 (1989) ("CSOs have been shown to have severe adverse impacts on water quality, aquatic biota, and human health under certain conditions.").

²⁷ See 33 U.S.C. § 1251(a) (1998). The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," including a national goal "that the discharge of pollutants into navigable waters be eliminated . . ." *Id.*

²⁸ See Bob Perciasepe, *Combined Sewer Overflows: Where are we four years after adoption of the CSO Policy?*, May 18, 1998, at 1 (visited Jan. 31, 1999) <<http://www.epa.gov/OWM/cso.htm>>.

²⁹ See *id.* at 3. This estimate is a great reduction from earlier estimates that ranged from \$80 to \$120 billion. See *id.* (noting earlier estimate of \$120 billion); *Environmental Groups Call for Efforts to Deal with Combined Sewer Problems*, 23 Env't Rep. (BNA) 13 (May 1, 1992) (estimating improvement costs at \$70 to \$80 billion); *Combined Sewer Overflow Problems Demand New Approach, Local Officials Say*, 20 Env't Rep. (BNA) 1939 (Apr. 6, 1990) (predicting costs as high as \$109 billion).

³⁰ See *supra* note 23 and accompanying text.

³¹ See *supra* note 23 and accompanying text.

³² See *Combined Sewer Overflow (CSO) Control Policy*, 59 Fed. Reg. 18,688, 18,688 (1994); MASSACHUSETTS DEP, GUIDANCE FOR ABATEMENT OF POLLUTION FROM CSO DISCHARGES 5 (1997) [hereinafter DEP CSO GUIDANCE]. "Since there is no finite limit to the magnitude and duration of a precipitation event, CSO controls can only lower the probability of untreated overflows, not eliminate them entirely." DEP CSO GUIDANCE, *supra*, at 5.

³³ See MWRA FEIR, *supra* note 2, at 25-71 (estimate based on MWRA data for its Cottage

unnecessary to prevent CSOs except for one percent of the time.³⁴ Therefore, while the CWA calls for the eventual elimination of point source discharges,³⁵ EPA recognizes that improvement in discharge frequency, quantity, and quality from CSOs must be phased in gradually on the road to total compliance.³⁶

II. THE CWA STRUCTURE

A. *History of Federal Clean Water Regulation*

The history of federal water quality management began in earnest with the Clean Water Quality Act of 1965 (1965 Act), which commanded states to establish, implement, and enforce water quality-based standards (WQSs) for interstate waters.³⁷ The 1965 Act focused on qualitative measures and provided for federal oversight of state efforts.³⁸ Thus, the 1965 Act marked a tremendous departure from the only previous enforceable water control regulation, the Refuse Act of 1899, which focused not on environmental protection, but on the maintenance of navigation under the review of the Army Corp of Engineers.³⁹

The 1966 Clean Water Restoration Act, and the Federal Water Pollution Control Act followed the 1965 Act,⁴⁰ as amended in 1972,⁴¹

Farm CSO Facility, discussed *infra* notes 206-15, showing elimination would require 8.72 million gallons of storage versus the 2.27 million gallons of storage needed to capture the flows of all but four storms per year).

³⁴ See *id.* Using this same facility, it must be seven times as large as one that prevents all but seven events per year—using the additional 85% of its capacity a mere 2% of the year. See *id.* at 25-70, 25-71 (1.3 million gallons of storage is sufficient to prevent CSOs in all but seven storms).

³⁵ See *supra* note 27 and accompanying text.

³⁶ See 59 Fed. Reg. at 18,689.

³⁷ See J. Gordon Arbucklem, *Water Pollution Control*, in ENVIRONMENTAL LAW HANDBOOK 151 (12th ed. 1993); 2 WILLIAM H. RODGERS, ENVIRONMENTAL LAW AIR AND WATER 242 (1986) [hereinafter RODGERS 2].

³⁸ See *Columbus and Francis County Metro. Park Dist. v. Shank*, 600 N.E.2d 1042, 1062 (Ohio 1992); SUSAN HUNTER & RICHARD W. WATERMAN, BUREAUCRACIES, PUBLIC ADMINISTRATION, AND PUBLIC POLICY 22 (1996).

³⁹ See Water Quality Act, ch. 758, 62 Stat. 1155 (1948); Arbucklem, *supra* note 37, at 152.

⁴⁰ See HUNTER & WATERMAN, *supra* note 38, at 22.

⁴¹ Pub. L. No. 92-500, 86 Stat. 816, 33 U.S.C. §§ 1251-1387 (1994). This amendment granted nationwide control of effluent standards to EPA to be set on an industry-by-industry basis. See Arbucklem, *supra* note 37, at 153.

1977,⁴² and 1987.⁴³ These amendments are commonly known as the Clean Water Act (CWA).⁴⁴

B. Technology Based Standards

The CWA divides regulation of water resources into water quality based standards and technology based standards.⁴⁵ The CWA further divides the technology based standards into Best Conventional Pollutant Control Technology (BCT)⁴⁶ and Best Available Technology Economically Achievable (BAT).⁴⁷

The most significant difference between the two technology based standards is the permissibility of economic considerations.⁴⁸ BCT, a lower standard applied to conventional pollutants, allows a consideration of comparative cost-benefits.⁴⁹ In contrast, BAT, a higher standard applied to toxics and nonconventional nontoxics, only considers the industry-wide costs and dismisses consideration of individual business closings unless the relationship between the costs and the additional water quality improvements are "wholly disproportionate."⁵⁰

The actual technologies required under each standard are evaluated under Best Professional Judgment (BPJ) and are established industry-wide.⁵¹ The CWA subjects all permitted discharges to technology based standards.⁵²

⁴² Pub. L. No. 95-217, 91 Stat. 1566 (1977) (codified as amended in scattered sections of 33 U.S.C.). This amendment added a control of toxics and incorporation of the Flannery Decree to the 1972 Amendment's focus on organic pollutants. See Arbucklem, *supra* note 37, at 154.

⁴³ Pub. L. No. 100-4, 101 Stat. 7 (1987). This amendment solidified the relationship between technology and water quality based controls. See Arbucklem, *supra* note 37, at 154.

⁴⁴ See 33 U.S.C. §§ 1251-1387 (1994).

⁴⁵ See *id.* §§ 1311, 1313, 1314; *National Combined Sewer Overflow Control Strategy*, 54 Fed. Reg. 37,370, 37,371 (1989).

⁴⁶ See 33 U.S.C. § 1311(b)(2)(E).

⁴⁷ See *id.* § 1311(b)(2)(A).

⁴⁸ See ZYGMUNT J.B. PLATER ET AL., *ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY* 522 (2d ed. 1998). Compare 33 U.S.C. § 1314(b)(2)(B) with 33 U.S.C. § 1314(b)(4)(B).

⁴⁹ See PLATER ET AL., *supra* note 48, at 523. Biochemical oxygen demand and suspended solids are specific examples of conventional pollutants highlighted by the CWA. See 33 U.S.C. § 1314(a)(4).

⁵⁰ PLATER ET AL., *supra* note 48, at 522. EPA determines what pollutants will be designated as toxics. See 33 U.S.C. §§ 1311(b)(2)(C), 1317(a)(1); see generally *Rybachek v. EPA*, 904 F.2d 1276 (9th Cir. 1976) (affirming EPA's determination that settleable solids were indicators of toxics and that EPA properly held applicant to BAT). Chemicals not included as toxics or conventionals, such as ammonia and chlorine, are deemed non-conventional pollutants. See 33 U.S.C. § 1311(b)(2)(F); PLATER ET AL., *supra* note 48, at 522.

⁵¹ See PLATER ET AL., *supra* note 48, at 522.

⁵² See Arbucklem, *supra* note 37, at 162-63.

C. *Water Quality Based Standards*

The 1965 Act required each state to develop WQSs and this requirement continues under the CWA.⁵³ States set WQSs to achieve the safe water quality of a water body based on its classified use, as well as antidegradation considerations.⁵⁴ States base these classifications on designated uses ranging from Class A, pristine waters; to Class B, fishable and swimmable waters; all the way to Class D, industrial usage.⁵⁵ States determine where the technology based measures are insufficient to meet the designated uses of the waters.⁵⁶ EPA may review state classifications and maintenance of designated uses for interstate and intrastate waters.⁵⁷

D. *NPDES Permits*

The CWA prohibits discharges of any pollutant into navigable waters by any person without a permit and discharges not in compliance with that permit.⁵⁸ BPJ controls the standards for effluent limitations under the permit.⁵⁹ Where the contents of a point source are known, EPA holds the permittee to the appropriate BCT or BAT.⁶⁰

EPA has primary authority to issue all NPDES permits.⁶¹ EPA may, however, delegate permitting authority to the states.⁶² Because NPDES permits are subject to the restrictions imposed by local WQSs, the CWA, through NPDES permitting, incorporates the state WQSs.⁶³

⁵³ See 33 U.S.C. § 1313; GREGOR I. MCGREGOR, ENVIRONMENTAL LAW AND ENFORCEMENT 21 (1994); *supra* note 37 and accompanying text. The CWA also set a national goal of fishable/swimmable waters by July 1, 1983. See 33 U.S.C. § 1251(a)(2). Predictably, the nation has not met this goal. See, e.g., *infra* note 196 and accompanying text.

⁵⁴ See DEP CSO POLICY, *supra* note 18, at 1.

⁵⁵ See RODGERS 2, *supra* note 37, at 243–44.

⁵⁶ See 33 U.S.C. § 1313(c), (d)(1)(A).

⁵⁷ See *id.* § 1313(a).

⁵⁸ See *id.* § 1311(a).

⁵⁹ See Arbuckle, *supra* note 37, at 162–63.

⁶⁰ See *supra* notes 46–50 and accompanying text.

⁶¹ See 33 U.S.C. § 1342(a); Arbuckle, *supra* note 37, at 164.

⁶² See 33 U.S.C. § 1342(b)–(c).

⁶³ See *id.* §§ 1311(b)(1)(C), 1342(a)(1).

III. PERMITTING CSOS

A. EPA CSO Policies

Despite passage of the CWA, until 1989 many regulators and municipalities thought that CSOs could be permitted under federal regulations without meeting effluent limitations.⁶⁴ Therefore, to address this (mis)understanding, EPA issued policies that incorporated CSOs into the federal scheme for improved water quality.⁶⁵ These policies reconciled the clear WQS violations presented by CSOs with the lack of an appropriate fit within the provisions of the CWA.⁶⁶

EPA recognizes that although the CWA envisions a "Zero-Discharge Goal,"⁶⁷ the goal merely creates a rebuttable presumption that all discharges harm the environment and that preservation of water quality requires the elimination of those discharges.⁶⁸ Thus, because the amount of inflow into CSSs controls the quantity of wet-weather event flows into the system, it is impossible to prevent a CSS overflow (such as when a 100-year storm occurs); some flexibility for large wet-weather events must be considered.⁶⁹

EPA's first policy, the 1989 National Combined Sewer Overflow Control Strategy (1989 CSO Policy), clarified that CSOs are considered point source discharges under the CWA;⁷⁰ thus, the NPDES permitting system controls CSOs.⁷¹ As such, CSOs are subject to technology based standards and must comply with WQSs.⁷²

⁶⁴ See *National Combined Sewer Overflow Control Strategy*, 54 Fed. Reg. 37,370, 37,371 (1989) (noting that the Policy was designed to "control effluents from combined systems which are not regulated under the sanitary system standards nor as discharges from separate storm sewer regulations"); *Northwest Env'tl. Assoc. v. City of Portland*, 56 F.3d 979, 985 (9th Cir. 1995) (noting confusion over effluent limitations for CSOs).

⁶⁵ See *Combined Sewer Overflow (CSO) Control Policy*, 59 Fed. Reg. 18,688, 18,688 (1994); 54 Fed. Reg. at 37,371; Smith, *supra* note 6, at 10,296.

⁶⁶ See 54 Fed. Reg. 37,371; *Northwest Env'tl. Assoc.*, 56 F.3d at 985; see also *Montgomery Env'tl. Coalition v. Costle*, 646 F.2d 568, 592 (D.C. Cir. 1980) (CSOs are not subject to secondary treatment standards but are subject to control under the water quality standards of 33 U.S.C. § 1311(b)(1)(B) (1998)).

⁶⁷ 33 U.S.C. § 1251(a)(1).

⁶⁸ See PLATER ET AL., *supra* note 48, at 508; see also RODGERS 2, *supra* note 37, at 249.

⁶⁹ See RAY K. LINSLEY ET AL., *WATER-RESOURCES ENGINEERING* 697 (4th ed. 1992); see also *supra* note 32 and accompanying text.

⁷⁰ See 54 Fed. Reg. at 37,371.

⁷¹ See Wheatly, *supra* note 8, at 188; Perciasepe, *supra* note 28, at 1.

⁷² See Wheatly, *supra* note 8, at 188.

The 1989 CSO Policy announced three objectives: (1) to ensure that CSO discharges occur only as a result of wet-weather;⁷³ (2) to bring all wet-weather CSO discharge points into compliance with the technology based requirements of the CWA and the applicable state WQSs; and (3) to minimize water quality, aquatic biota, and human health impacts from wet-weather discharges.⁷⁴ In accordance with these goals, the 1989 CSO Policy allowed, in certain situations, a minimal number of overflows which were still compatible with WQSs.⁷⁵

The current policy, EPA's 1994 Combined Sewer Overflow Control Policy (1994 CSO Policy), elaborates on the 1989 CSO Policy and is designed to expedite compliance with the CWA.⁷⁶ EPA's 1994 CSO Policy is the result of a series of negotiations among EPA, regulated municipalities, and other stakeholders.⁷⁷ The 1994 CSO Policy addresses the perceived shortcomings of the 1989 CSO Policy by including a greater recognition of the highly variable and localized nature of CSOs and the high costs of elimination.⁷⁸ For example, EPA estimated the costs of CSO cleanup under the 1989 Policy at \$120 billion; the 1994 Policy reduced those estimates to \$41 billion.⁷⁹

B. Water Quality Based Standards

Under the 1994 CSO Policy, permit applicants establish compliance with WQSs either through a Presumption Approach or through a Demonstration Approach.⁸⁰ In short, the Presumption Approach al-

⁷³ See Arbuckle, *supra* note 37, at 193. Dry CSO events are specifically prohibited; the 1987 amendment to the CWA requires that all permits include a prohibition on non-storm CSO discharges. See *id.*

⁷⁴ See 54 Fed. Reg. at 37,371.

⁷⁵ See *id.* However, the Policy also recognized that some WQSs would need to be adjusted to address CSO impacts during wet-weather events. See *id.* at 37,373.

⁷⁶ See *Combined Sewer Overflow (CSO) Control Policy*, 59 Fed. Reg. 18,688, 18,688 (1994).

⁷⁷ See Siobhan Mee, Note, *Negotiated Rulemaking and Combined Sewer Overflows (CSOs): Consensus Saves Ossification?*, 25 B.C. ENVTL. AFF. L. REV. 213, 242 (1997).

⁷⁸ See 59 Fed. Reg. at 18,688. The 1994 CSO Policy reiterated the 1989 CSO Policy objectives and introduced four additional principles: (1) clear levels of control that would be presumed to meet appropriate health and environmental objectives; (2) sufficient flexibility to municipalities, especially financially disadvantaged communities, to consider the site-specific nature of CSOs and to determine the most cost-effective means of reducing pollutants and meeting CWA objectives and requirements; (3) a phased approach to implementation of CSO controls considering the community's financial capability; and (4) review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet-weather impacts of CSOs. See *id.* at 18,689.

⁷⁹ See Perciasepe, *supra* note 28, at 3.

⁸⁰ See 59 Fed. Reg. at 18,692-93.

lows a permit holder to presume compliance with WQSs if the permit holder achieves: (1) no more than four to six treated discharges per year;⁸¹ (2) elimination or capture of eighty-five percent of the volume of pollutants concerned; or (3) elimination or capture of eighty-five percent of the mass of pollutants concerned.⁸² The Demonstration Approach requires the permit holder to establish that the program will meet the state WQSs, and that it can be expanded to meet future, further regulation.⁸³

NPDES permit writers can establish water quality based effluent limits to meet a receiving water body's classification, such as a maximum number of overflows per year, effluent limits, and a specification of minimum treatment or capture.⁸⁴ Permit limits may be conditioned on storm events to accommodate yearly fluctuations in precipitation.⁸⁵

C. Technology Based Standards

Prior to the 1989 CSO Policy, EPA was unable to establish a BAT or a BCT standard for CSOs because discharges were controlled by the amount of infiltrating stormwater or melting snow and there was no practical way to predict the relative proportions of sewage and rainwater.⁸⁶ Permit writers were left to exercise their best professional judgment.⁸⁷ Consequently, much of the regulation for these discharges originated from, and relied upon, best professional judgment solutions that, unlike BAT/BCT, introduced site-specific considerations and provided for greater flexibility in addressing local economic and technical realities.⁸⁸

The 1994 CSO Policy established a framework for evaluating the technology based requirements of the CWA and NPDES permits.⁸⁹ The policy breaks the NPDES permitting process into two phases.⁹⁰ Phase I permitting requires the permit holder to adopt and implement

⁸¹ The 1994 CSO Policy defines treatment as: (1) primary clarification; (2) solids and floatables disposal; and, if necessary, (3) disinfection of effluents. *See id.* at 18,693.

⁸² *See id.* at 18,692-93; Wheatly, *supra* note 8, at 192.

⁸³ *See* 59 Fed. Reg. at 18,693; Wheatly, *supra* note 8, at 192.

⁸⁴ *See* 59 Fed. Reg. at 18,696.

⁸⁵ *See id.*

⁸⁶ *See generally* Smith, *supra* note 6; *see also supra* note 32 and accompanying text.

⁸⁷ *See* Wheatly, *supra* note 8, at 189.

⁸⁸ *See* PLATER ET AL., *supra* note 48, at 525; *see also supra* notes 46-51 and accompanying text.

⁸⁹ *See* 59 Fed. Reg. at 18,696.

⁹⁰ *See id.*

Nine Minimum Controls (NMCs)⁹¹ and to develop a Long-Term CSO Control Plan (LTCP).⁹² EPA intends to minimize CSO impacts through the NMCs by optimizing the use of existing CSO and wastewater facilities, as well as the use of pollution prevention, public notification, and monitoring programs.⁹³ Implementation of the NMCs serves as the minimum technology based limitation, establishing the BAT/BCT.⁹⁴ EPA has anticipated implementation of NMCs since January 1, 1997.⁹⁵

While the scope of the NMCs includes the collection system and source controls, it is only a basic guideline—a minimum.⁹⁶ These technological implementations do not ensure compliance with state WQSs.⁹⁷ Thus, the permittee must also develop an LTCP under Phase I to show how the permittee ultimately plans to comply with the CWA and applicable WQSs.⁹⁸ The NMCs are significant to the WQSs because they provide the data for cost-benefit and feasibility studies, which will determine the permitting requirements for the LTCP.⁹⁹

EPA designed the LTCP to provide the requisite technical and economic analysis to: (1) determine whether elimination of CSOs is feasible; (2) provide a basis for determining which abatement measures should be implemented for CSOs that will not be eliminated; and (3) determine an appropriate schedule for all CSO abatement activities.¹⁰⁰ The LTCP consists of the following elements:

- (1) Watershed characterization, monitoring, and modeling of CSSs;
- (2) Public participation;

⁹¹ The nine minimum controls are as follows: (1) Proper operation and regular maintenance programs for the sewer system and the CSOs; (2) Maximum use of the collection system for storage; (3) Review and modification of pretreatment requirements to assure CSO impacts are minimized; (4) Maximization of flow to the POTW for treatment; (5) Prohibition of CSOs during dry weather; (6) Control of solid and floatable materials in CSOs; (7) Pollution prevention; (8) Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and (9) Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls. *See id.* at 18,691.

⁹² *See id.* at 18,688.

⁹³ *See supra* note 91 and accompanying text.

⁹⁴ *See* 59 Fed. Reg. at 18,696.

⁹⁵ *See* Perciasepe, *supra* note 28, at 2. However, according to EPA sources, as of April 19, 1998, only slightly more than half of Massachusetts communities have implemented the NMCs; the remainder are scheduled for implementation within the next two years. *See id.* at 4.

⁹⁶ *See* 59 Fed. Reg. at 18,695–96.

⁹⁷ *See id.* at 18,695.

⁹⁸ *See id.* at 18,691.

⁹⁹ *See* DEP CSO GUIDANCE, *supra* note 32, at 5.

¹⁰⁰ *See* 59 Fed. Reg. at 18,691; MASS. REGS. CODE tit. 310, § 44.00 (1998).

- (3) Maximizing efforts for sensitive use areas;
- (4) Detailed evaluation of alternatives;
- (5) Cost/performance considerations;
- (6) Operation and maintenance plans for facilities where CSOs will continue;
- (7) Maximizing usefulness of POTWs during wet-weather events;
- (8) Preparing a schedule for implementation reflecting current CSO impacts on WQSs; and
- (9) A post-construction monitoring program to verify continued compliance and to determine efficiency.¹⁰¹

The elements of the LTCP provide the factual and analytical basis for subsequent efforts to change a designated use.¹⁰² Phase II of the permitting requires continued implementation and compliance with the NMCs and the implementation of the LTCP developed under Phase I.¹⁰³

IV. RECEIVING BODY CLASSIFICATIONS FOR CSOs

A. *Massachusetts Designated Uses*

Under the existing regulatory framework, all Massachusetts CSO dischargers must obtain a NPDES Surface Water Discharge Permit and a Massachusetts Surface Water Discharge Permit.¹⁰⁴ Massachusetts WQSs establish goals for the Commonwealth and provide the basis for water quality based effluent limitations in NPDES permits.¹⁰⁵

In response to the 1994 CSO Policy, DEP issued its own CSO Policy (DEP CSO Policy) and amended its WQSs to reflect CSO-impacted designated uses.¹⁰⁶ The DEP CSO Policy, building upon the flexible classifications proposed by EPA's 1994 CSO Policy, provides a menu

¹⁰¹ See 59 Fed. Reg. at 18,691-94; MASS. REGS. CODE tit. 310, § 44.08.

¹⁰² See MASSACHUSETTS DEP, MWRA COMBINED SEWER OVERFLOW FINAL FACILITIES PLAN/ENVIRONMENTAL IMPACT REPORT: STATE ADMINISTRATIVE DETERMINATIONS FOR CERTAIN CSO-IMPACTED WATERS; USE ATTAINABILITY ANALYSIS 12 (1997) [hereinafter DEP UAA]; DEP CSO GUIDANCE, *supra* note 32, at 4; see also MASS. REGS. CODE tit. 310, § 44.00, tit. 314, § 4.06(1)(d)(10).

¹⁰³ See 59 Fed. Reg. at 18,696.

¹⁰⁴ See DEP CSO POLICY, *supra* note 18, at 1; see also *supra* notes 71-72. DEP regulates the Massachusetts WQSs. See MASS. GEN. LAWS ch. 22, § 21 (1991).

¹⁰⁵ See MASS. REGS. CODE tit. 314, § 4.01(4); DEP CSO POLICY, *supra* note 18, at 1.

¹⁰⁶ See DEP CSO GUIDANCE, *supra* note 32, at 3; MASS. REGS. CODE tit. 314, §§ 4.06(1)(d)(9)-(10).

of options to accommodate a variety of CSO scenarios and adjusts the classifications of the receiving water bodies.¹⁰⁷ Some of these classifications allow for CSO impacts during wet-weather events without downgrading the year-round WQs.¹⁰⁸ Thus, NPDES permit holders for CSOs can still have some discharges without violating the Commonwealth's WQs.¹⁰⁹ These water body classifications in Massachusetts are as follows:

- (1) Class B or SB—all CSOs are eliminated;
- (2) Class B_{CSO} or SB_{CSO}—CSOs are allowed if they conform to water quality goals;
- (3) Variance—violation of standards are allowed on a short-term basis;
- (4) Partial Use Designation—CSOs remain with moderate impacts resulting in intermittent impairment of water quality goals, but classification of the receiving water body is unchanged;
- (5) Class C—CSOs remain, causing permanent and sustained impairment so that Class B water quality goals cannot be met.¹¹⁰

Where permit holders can eliminate CSOs through sewer separation or relocation, DEP should classify the receiving waters as Class B or SB.¹¹¹ CSS owners in Class B or SB waters must eliminate all CSOs either by sewer separation or by relocating discharges to other, less sensitive use areas.¹¹²

CSO control plans achieving compliance with Class B/SB standards at least ninety-five percent of the time should be classified as B_{CSO} or SB_{CSO}.¹¹³ In B_{CSO}/SB_{CSO} waters, although permit holders will achieve high levels of control, they will not achieve Class B/SB standards during infrequent, large storm events.¹¹⁴

DEP will only change a classification to B_{CSO} after approving a Facilities Plan submitted by the permittee which shows that there are no sensitive uses and that infrequent CSO discharges are the most environmentally protective and cost-effective option available.¹¹⁵ The

¹⁰⁷ See DEP CSO POLICY, *supra* note 18, at 1.

¹⁰⁸ See *id.*

¹⁰⁹ See *id.* at 3-4.

¹¹⁰ See MASS. REGS. CODE tit. 314, §§ 4.05, 4.06(1)(d)(9)-(10); DEP CSO POLICY, *supra* note 12, at 1. The "S" differentiates marine bodies from freshwater, i.e., "B" waters. See MASS. REGS. CODE tit. 314, § 4.05(4).

¹¹¹ See MASS. REGS. CODE tit. 314, § 4.05(3)(b); DEP CSO POLICY, *supra* note 18, at 3.

¹¹² See DEP CSO POLICY, *supra* note 18, at 3.

¹¹³ See *id.* at 4.

¹¹⁴ See *id.* at 3.

¹¹⁵ See *id.* at 3.

Facilities Plan serves as the LTCP required by EPA's 1994 CSO Policy and Phase I of NPDES permitting.¹¹⁶

Variance in a receiving body classification, as in landuse planning, is an approved, limited violation of the restrictions imposed by the classification.¹¹⁷ The requirements of Variance are similar to classification changes, but the standard of proof to show the infeasibility of the total elimination of discharges is lower because Variance is temporary.¹¹⁸ Variance is only effective through the discharge permit and does not affect the designated use for the receiving body.¹¹⁹ Variance is based on a conclusion that, pending further study, the permit conditions are the most environmentally protective and cost-effective option available.¹²⁰ Granting Variance to a permit holder is most appropriate as an interim measure where the relative CSO impacts and feasibility are uncertain and where a designated use of Class B or A may be achieved rather than accepting an impacted or lower designated use.¹²¹

Partial Use is another alternative used in situations where the prescribed uses cannot, and will not, be met for an intermittent time, i.e., a limited number of short duration discharges per year based on one year or other design storms.¹²² Partial Use designations permit a temporary impairment of the designated use and a change in classification for the body.¹²³ A river basin, or other body, can be classified under Partial Use to be fishable/swimmable for 360 days per year, and

Abatement plans may involve phased work plans with the most cost effective control given the highest priority It is the goal of the Department to eliminate the adverse impacts of CSOs. Where elimination is not feasible or would cause substantial widespread economic and social impact, the impacts of the CSO discharges shall be minimized to achieve the highest water quality attainable. Highest priority will be given to eliminating or otherwise controlling CSO discharges to sensitive use areas.

Id.

¹¹⁶ See MASS. REGS. CODE tit. 310, § 44.00 (1998); *supra* note 98 and accompanying text. MWRA's FEIR addresses all nine requirements for a LTCP under EPA's 1994 CSO Policy. See MWRA FEIR, *supra* note 2, at 7-2.

¹¹⁷ See MASS. REGS. CODE tit. 314, § 4.04(4).

¹¹⁸ See DEP CSO POLICY, *supra* note 18, at 5.

¹¹⁹ See *id.*

¹²⁰ See MASS. REGS. CODE tit. 314, § 4.04(4)(a)(1-4).

¹²¹ See DEP CSO GUIDANCE, *supra* note 32, at 12-13.

¹²² See DEP CSO POLICY, *supra* note 18, at 5. Design storms are hypothetical storms that model typical conditions for intensity and duration. See MCGHEE, *supra* note 3, at 270. They are categorized by approximated return periods; a one year design storm is the heaviest storm anticipated for a one year period. See *id.*

¹²³ See MASS. REGS. CODE tit. 314, §§ 4.05(2), 4.06(1)(d)(9).

classified for a lower designated use during the remaining days.¹²⁴ Thus, unlike Variance, DEP actually changes the designated use in recognition of different quantities of contribution to the collection system based on larger wet-weather events.¹²⁵ Short-term impairments usually must meet the higher classification standard at least seventy-five percent of the time.¹²⁶ Partial Use can be defined as a function of a particular season or a particular storm event.¹²⁷ The change to Partial Use must fully maintain downstream existing uses in other seasons or smaller storm events.¹²⁸

However, with the clarification of the 1989 CSO Policy by the 1994 CSO Policy, EPA disfavored the Partial Use classification in favor of a greater emphasis on Variance.¹²⁹ EPA prefers Variance because it is temporary and must be renewed with the expiration of the underlying permit, giving EPA and DEP greater bargaining power to insist on continued planning and implementation efforts by permit holders.¹³⁰

Finally, Class C is a last resort classification where feasible CSO controls cannot, and will not, achieve the current designated use.¹³¹ This classification admits the impossibility of compliance with the goals of the CWA for the foreseeable future.¹³²

B. Changing Receiving Body Classification

The menu of classifications enhances flexibility for permittees, minimizes demands on DEP's administrative resources, and provides equivalent environmental protection consistent with the realities of CSO abatement.¹³³ DEP may change designated uses to allow CSO discharges to continue if DEP finds, based on the permittee's LTCP, that

¹²⁴ See DEP CSO POLICY, *supra* note 18, at 5.

¹²⁵ See MASS. REGS. CODE tit. 314, § 4.05(2); DEP CSO POLICY, *supra* note 18, at 5.

¹²⁶ See DEP CSO POLICY, *supra* note 18, at 5.

¹²⁷ See *id.*

¹²⁸ See MASS. REGS. CODE tit. 314, § 4.05(2); DEP CSO POLICY, *supra* note 18, at 5.

¹²⁹ See DEP CSO POLICY, *supra* note 18, at 2 & n.3.

¹³⁰ See MASS. REGS. CODE tit. 314, § 4.04(4)(c); Commonwealth of Massachusetts, Executive Office of Environmental Affairs, CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS ON THE FINAL FACILITIES PLAN/ENVIRONMENTAL IMPACT REPORT 7 (1997) [hereinafter FEIR CERTIFICATE] (showing the practical way the review period of Variance can be used to assess impacts achieved through implementation of the NMCs); see also DEP CSO POLICY, *supra* note 18, at 4.

¹³¹ See MASS. REGS. CODE tit. 314, § 4.05(3)(c); DEP CSO POLICY, *supra* note 18, at 5.

¹³² See DEP CSO POLICY, *supra* note 18, at 5.

¹³³ See *supra* note 107 and accompanying text.

elimination is infeasible.¹³⁴ Permittees most often establish economic infeasibility by showing that the costs of elimination would impose substantial and widespread social and economic impact.¹³⁵

DEP seeks public participation in considering technical, financial, and environmental implications.¹³⁶ Before changes in classifications of receiving bodies may be implemented, the public must be given an opportunity to comment.¹³⁷ For example, DEP must publish a notice in the *Environmental Monitor* before changing a classification to B_{CSO}.¹³⁸ For class downgrades to B_{Partial} or C, DEP is required to hold a public hearing.¹³⁹ In addition, DEP must review all classifications every three years.¹⁴⁰

Once a state determines that a designated use for a body of water should be downgraded, the state agency must submit a Use Attain-

¹³⁴ See MASS. REGS. CODE tit. 314, § 4.03(4). This section allows the removal of a designated use that is not an existing use, if the applicant demonstrates that:

(a) Naturally occurring pollutant concentrations prevent the attainment of the use; or

(b) Natural, ephemeral intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met; or

(c) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(d) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(e) Physical conditions related to the natural features of the water body, such as the lack of proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(f) Controls more stringent than those required by sections 310(b) and 306 of the Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) would result in substantial and widespread economic and social impact.

Id.

¹³⁵ See Letter from John P. DeVillars, Regional Administrator, EPA, to David B. Struhs, Commissioner, DEP 1 (Feb. 27, 1998) [hereinafter EPA Concurrence] (regarding EPA's Concurrence with DEP's UAA).

¹³⁶ See DEP CSO POLICY, *supra* note 18, at 6.

¹³⁷ See 33 U.S.C. § 1313(c) (1994); 40 C.F.R. § 131.20 (1999); MASS. REGS. CODE tit. 314, § 4.03(4).

¹³⁸ See MASS. GEN. LAWS ch. 30A, § 3 (1998); MASS. REGS. CODE tit. 314, § 4.05(2).

¹³⁹ See MASS. GEN. LAWS ch. 30A, § 3; MASS. REGS. CODE tit. 314, § 4.03(4)(c).

¹⁴⁰ See 33 U.S.C. § 1313; 40 C.F.R. §§ 131.10, 131.20; MASS. REGS. CODE tit. 310, § 41.00. As part of this review, EPA will determine whether any allowable CSO designations can feasibly be upgraded to Class B. See DEP CSO POLICY, *supra* note 18, at 7.

ability Analysis (UAA) to EPA.¹⁴¹ State agencies prepare the UAA based on the permittee's LTCP.¹⁴² The UAA documents the infeasibility of achieving a higher level of CSO control.¹⁴³

EPA requires that the UAA findings be based on a "structured scientific assessment" of the existing water body conditions, including the chemical, physical, and biological attributes, as well as the economic dependence and impacts associated with the water body usage.¹⁴⁴ EPA may remove designated uses, but not existing uses, for a variety of reasons relating to the particular nature of the receiving body or the economic impacts of achieving the current designated use.¹⁴⁵ EPA can reject any state criteria that does not protect the designated use or that is not based on a sound scientific rationale.¹⁴⁶ No federal or state authority may remove an existing use—defined as those that occurred as of November 28, 1975.¹⁴⁷

Once the state agency forwards its recommendation and UAA to EPA, EPA has sixty days to approve, or ninety days to disapprove, the modified usage.¹⁴⁸ Both EPA and DEP are unlikely to forgive discharges affecting sensitive use areas, such as bathing areas, water supply intakes, endangered species habitats, and shellfish beds.¹⁴⁹

C. Abatement Measures

As part of the evaluation for changing designated uses under the 1994 CSO Policy, and by incorporation of these considerations into the DEP CSO Policy, the reviewing agency will look to the LTCP to evaluate the feasibility of using alternate methods of reducing water quality impairments from CSOs.¹⁵⁰ Because sewer separation, where the sewer is separated from stormwater collection and conveyed in separate pipes, does not address continued discharges of stormwater,

¹⁴¹ See 40 C.F.R. § 131.10; MASS. REGS. CODE tit. 314, § 4.06(1)(d)(10).

¹⁴² See DEP UAA, *supra* note 102, at 12.

¹⁴³ See 40 C.F.R. § 131.10(g).

¹⁴⁴ U.S. ENV'T'L PROTECTION AGENCY, WATER ENVIRONMENT RESEARCH FOUNDATION DEVELOPS PRACTICAL GUIDANCE DOCUMENT FOR CONDUCTING USE-ATTAINABILITY ANALYSIS 2 (1996).

¹⁴⁵ See 40 C.F.R. § 131.10(g).

¹⁴⁶ See *supra* note 144 and accompanying text.

¹⁴⁷ See 40 C.F.R. §§ 131.3, 131.10(g) (defining existing uses).

¹⁴⁸ See 33 U.S.C. § 1313(c)(3) (1994).

¹⁴⁹ See *Combined Sewer Overflow (CSO) Control Policy*, 59 Fed. Reg. 18,688, 18,692 (1994); DEP CSO POLICY, *supra* note 18, at 7.

¹⁵⁰ See *supra* note 100–02 and accompanying text.

alternative CSO controls can provide superior environmental benefits to receiving bodies while supporting existing and proposed uses and associated WQSS.¹⁵¹

Nonetheless, sewer system separation remains the only guaranteed method of eliminating CSOs.¹⁵² Thus, the permittee must evaluate the feasibility of separation before considering any alternatives.¹⁵³ However, where separation is not feasible, the permit holder has several alternatives it can propose, including relocation, storage, and treatment.¹⁵⁴

As an alternative to elimination, relocation is an attractive alternative for protecting sensitive uses such as bathing areas, shellfishing areas, water supply sources, and endangered species habitats.¹⁵⁵ The relocation of discharges away from sensitive-use environments to less fragile areas achieves many of the goals of the CWA.¹⁵⁶ However, relocation still results in CSO discharges and, therefore, may not achieve the overall water quality benefits of separation.¹⁵⁷ Nonetheless, sensitive areas benefit by becoming "CSO-Free."¹⁵⁸

Storage and treatment are alternatives to relocation or separation.¹⁵⁹ Storage functions much like a detention basin, allowing for timed releases of sewage and stormwater accumulated during heavy precipitation or melting periods.¹⁶⁰ Storage facilities gradually release the accumulated volumes, avoiding peak flow times that trigger CSOs and allow the stored sewage and stormwater to stay in the CSS system for treatment at the POTW.¹⁶¹

¹⁵¹ See 59 Fed. Reg. at 18,688; DEP CSO POLICY, *supra* note 18, at 7; Letter from Arleen O'Donnell, Assistant Commissioner, DEP, to Ron Manfredonia, Associate Director for Water Quality Policy, EPA 3 (July 25, 1997) [hereinafter DEP Response to EPA] (regarding DEP Draft CSO Policy and Guidance); see also FEIR CERTIFICATE, *supra* note 130, at 2 (discussing significant impact of stormwater on water quality, much of which would continue even if separation occurred). "Water quality modeling has demonstrated that in some areas, alternative CSO controls, such as storage and/or treatment, would provide superior water quality benefits, at equivalent or lower cost as compared to full separation." DEP Response to EPA, *supra*, at 2.

¹⁵² See DEP CSO GUIDANCE, *supra* note 32, at 5 (as long as sewers are combined with stormwater inflows, the potential volume of inflows is unlimited).

¹⁵³ See *id.* at 5-6.

¹⁵⁴ See *id.*

¹⁵⁵ See *id.*

¹⁵⁶ See *supra* notes 27, 53, 112 and accompanying text.

¹⁵⁷ See *supra* note 152 and accompanying text.

¹⁵⁸ See *supra* note 156 and accompanying text.

¹⁵⁹ See DEP CSO GUIDANCE, *supra* note 32, at 6.

¹⁶⁰ See *id.*

¹⁶¹ See *id.*

Treatment functions like a miniature POTW.¹⁶² Treatment of CSOs includes screening, removing solids, and disinfecting overflows before they reach the receiving body.¹⁶³ This treatment minimizes the negative impact of discharges on the receiving body.¹⁶⁴ As with all alternatives, permittees must evaluate the effectiveness and viability of treatment for a location and compare the treatment results to the feasibility of discharge elimination.¹⁶⁵

A review of alternative control technologies includes the following factors: increases in stormwater flow and changes in pollutant load achieved through sewer separation; CSO corrective action time frames for alternative control options; presence and effect on sensitive-use areas; cost-benefit analysis based on receiving body water quality improvements; construction impacts on surrounding businesses; and projected effectiveness of alternative control measures based, in part, on results achieved through the NMCs in Phase I.¹⁶⁶

D. *Establishing Infeasibility On Economic Grounds*

Permit applications and procedures for changing designated uses factor economic considerations into each stage of review.¹⁶⁷ In developing the LTCP, the 1994 CSO Policy recommends that the permit applicant evaluate alternative abatement measures using a “knee of the curve” analysis—charting the effectiveness of each measure in attaining water quality benefits versus the cost of additional measures.¹⁶⁸ If, as part of the LTCP, the permittee finds that CSO elimination is economically infeasible, the applicant submits her findings to DEP with her LTCP requesting a change in designated use.¹⁶⁹

In evaluating whether to grant a change in designated use, DEP looks to a variety of natural factors affecting attainability, as well as whether CSO elimination would cause “substantial and widespread social and economic impacts” on the community.¹⁷⁰ DEP makes several

¹⁶² See *id.*

¹⁶³ See *id.*

¹⁶⁴ See DEP CSO GUIDANCE, *supra* note 32, at 6.

¹⁶⁵ See *supra* note 152–53 and accompanying text.

¹⁶⁶ See DEP UAA, *supra* note 102, at 10.

¹⁶⁷ See, e.g., 40 C.F.R. § 131.10(g)(6) (1999); *Combined Sewer Overflow (CSO) Control Policy*, 59 Fed. Reg. 18,688, 18,688 (1994); MASS. REGS. CODE tit. 314, § 4.03(4) (1998).

¹⁶⁸ 59 Fed. Reg. at 18,688. A “knee of the curve” analysis evaluates the additional water quality benefits per control measure looking for the point at which the return on investment is diminished regardless of additional efforts. See *infra* notes 249–52 and accompanying text.

¹⁶⁹ See MASS. REGS. CODE tit. 314, § 4.03(4); *supra* notes 134–35 and accompanying text.

¹⁷⁰ MASS. REGS. CODE tit. 314, § 4.03(4).

references to this test, explaining it as an incremental cost-benefit or cost-effectiveness review.¹⁷¹

In order to meet the required "showings" of effectiveness and preference for an alternative, a permit holder or applicant may present: (1) average annual duration and volume of CSO for each alternative; (2) model outputs which estimate the duration of violations of WQSs such as fecal coliform for a range of storm events, as well as an annual average; (3) model outputs estimating frequency and duration of beach closings or other use losses; and (4) average annual pollution load removal and cost.¹⁷² The evaluation should contain a comparison of the costs, performance, and technical considerations of all abatement alternatives.¹⁷³

Since EPA's 1994 CSO Policy universally requires NMC implementation by all permit holders under Phase I, the results observed from implementing these measures provide a practical baseline for comparing technologies in each receiving body.¹⁷⁴ Assuming a finding of substantial impact, DEP submits a UAA to EPA recommending a change in designated use.¹⁷⁵

Finally, the same language of "substantial and widespread social and economic impacts" appears in EPA's review of whether to approve state requests for changes in designated uses.¹⁷⁶ Since there is little guidance in the 1994 CSO Policy, EPA published an economic guidance recommending a method of calculating the impact that states may use.¹⁷⁷

V. MWRA'S APPLICATION FOR AN NPDES PERMIT

A. *Success Under the 1994 CSO Plan*

As discussed, EPA acknowledges a substantial change in the scope of required work between the 1989 CSO Policy and the 1994 CSO Policy.¹⁷⁸ These changes in policy, though laudable for their consideration of economic consequences, caused some uncertainty and confu-

¹⁷¹ See *infra* notes 278-86 and accompanying text.

¹⁷² See DEP CSO GUIDANCE, *supra* note 32, at 7-8.

¹⁷³ See *id.* at 7.

¹⁷⁴ See *supra* note 99 and accompanying text.

¹⁷⁵ See *supra* notes 141-43 and accompanying text.

¹⁷⁶ 40 C.F.R. § 131.10(g)(6) (1999).

¹⁷⁷ See U.S. EPA, ECONOMIC GUIDANCE FOR WATER QUALITY STANDARDS—WORKBOOK, (1995) [hereinafter EPA ECONOMIC GUIDANCE], at cover letter.

¹⁷⁸ See *supra* notes 29, 78-79 and accompanying text.

sion for permit applicants.¹⁷⁹ For example, MWRA plans to receive NPDES permitting evolved from MWRA's original plan, which called for a tunneled storage facility under Boston, to the present plan which combines treatment, separation, CSS capacity increases, and increased pumping capacity at the POTW.¹⁸⁰

The original MWRA plan, developed prior to the 1994 CSO Policy, emphasized storage of excess flows during wet-weather events by tunneling a twenty-five foot wide tunnel, thirteen miles long, under Boston.¹⁸¹ This tunnel would have cost \$1.3 billion.¹⁸² However, based on studies consistent with the mandates of the NMCs,¹⁸³ EPA and MWRA concluded that this measure was an overstatement of actual conditions and actions required.¹⁸⁴ This change in understanding developed in part from the greater flexibility and the introduction of a cost-benefit analysis in early drafts of the 1994 CSO Policy, which EPA was developing concurrently with MWRA's request for approval.¹⁸⁵

¹⁷⁹ See, e.g., DEP Response to EPA, *supra* note 151, at 1 (expressing confusion that EPA disagreed with DEP's CSO Policy position regarding economic infeasibility, noting that "[a]ny determination that fails to consider water quality benefits appears to be inconsistent with EPA regulations, guidance and policies, including the EPA 1994 National CSO Policy . . ."); Letter from Ron Manfredonia, Associate Director for Water Quality Policy, EPA, to Arleen O'Donnell, Assistant Commissioner, DEP 2 (May 7, 1997) (regarding EPA Comments on [DEP's] Draft CSO Policy and Draft CSO Guidance) [hereinafter EPA Comments] (declaring the "knee of the curve" analysis, *infra* notes 249–52, inappropriate in determining substantial and widespread social and economic impacts).

¹⁸⁰ See Letter from Steven G. Lipman, Boston Harbor Coordinator, DEP, to Douglas MacDonald, Executive Director, MWRA 3 (Oct. 31, 1997) [hereinafter DEP Tentative FEIR Approval] (regarding MWRA CSO Control Program Final Facilities Plan Tentative Approval); FEIR CERTIFICATE, *supra* note 130, at 1; Patrick M. Fitzgibbons, *Cleanup of Boston Harbor Has Caught \$1 Billion Break, Authority Reports*, THE BOND BUYER, Sept. 9, 1994, at 3 (the original proposal by MWRA contemplated tunneled storage under Boston); Scott Allen, *MWRA Plan Slashes Cost of Harbor Cleanup*, BOSTON GLOBE, Sept. 8, 1994, at 25 (original MWRA proposal called for a tunnel under Boston).

¹⁸¹ See Fitzgibbons, *supra* note 180, at 3 (proposed tunnel under Boston would have been 13 miles long and 25 feet wide).

¹⁸² See Allen, *supra* note 180, at 25 (the original MWRA proposal, based on a tunnel under Boston, had an estimated price tag of \$1.3 billion).

¹⁸³ See *supra* notes 91, 99 and accompanying text.

¹⁸⁴ See Interview with Virginia Renick, MWRA (Aug. 14, 1997) [hereinafter Renick Interview, 8/14/97]; see also Scott Allen, *Charles Cleanup Gets New EPA Push. Focus This Time Around On Pollution Prevention*, BOSTON GLOBE, Oct. 22, 1995, at 33 ("But unlike the multibillion-dollar project to clean up Boston Harbor, the EPA plan stresses low-cost measures first, from better street sweeping and plumbing repairs to increased chlorination of storm water . . . state and local environmental officials now believe the pollution sources along the Charles are so diffuse—spread across nine cities and towns—that the MWRA's combines sewer overflow program might not solve the problem.").

¹⁸⁵ See Tour of MWRA CSO Facilities, October 31, 1997 [hereinafter MWRA CSO Tour].

Thus, in 1994, MWRA set about developing a more realistic response to CSOs which incorporated the studies of contributing environmental groups and the beginnings of the NMC.¹⁸⁶ MWRA presented a plan outlining twenty-eight separate projects, including separation, detention, and treatment, with an estimated cost of \$372 million.¹⁸⁷

Public officials heralded the MWRA plan as a model of regulatory cooperation, symbolizing the collaborative efforts underlying the 1994 CSO Policy.¹⁸⁸ The cooperative nature led to a reasoned proposal that reduced a \$1.3 billion project to a series of separate projects at one-third of the cost.¹⁸⁹

In April of 1996, Vice President Al Gore visited Massachusetts and, standing out on Flagship Wharf in the Charlestown Navy Yard with U.S. Senator John F. Kerry (D. Mass.) and Boston Mayor Thomas Menino, announced that federal officials applauded MWRA's CSO Plan.¹⁹⁰ However, as MWRA neared its review by EPA in 1997, EPA appeared reluctant to approve MWRA's plan, in part, because of EPA's initiation of an aggressive plan in 1996 for a "Fishable, Swimmable Charles by 2005" campaign.¹⁹¹

As part of MWRA's continuing improvements, MWRA began conversion of several CSO sites, which were then only screening and disinfecting CSOs, to combined storage/treatment facilities.¹⁹² With continued implementation, MWRA projected an estimated cost of \$451 million for its final CSO control plan.¹⁹³ However, even after these changes, MWRA still anticipated that EPA would not concur with any DEP UAA for changes in designated use for the Charles River.¹⁹⁴ The change in EPA's position, from earlier anticipation of approval, swung in significant part on its interpretation of the standards applied to

¹⁸⁶ See Renick Interview, 8/14/97, *supra* note 184.

¹⁸⁷ See MWRA FEIR, *supra* note 2, at 3-5, 3-6. This proposal was known as the 1994 CSO Conceptual Plan. See *id.* at 3-5.

¹⁸⁸ See *A Better Solution for the Harbor*, BOSTON GLOBE, Apr. 25, 1996, at 20; Richard Chacon, *Gore: Scaled-Down Harbor Plan OK'd*, BOSTON GLOBE, Apr. 21, 1996, at 22.

¹⁸⁹ See Allen, *supra* note 180, at 25.

¹⁹⁰ See Chacon, *supra* note 188, at 22.

¹⁹¹ See Renick Interview, 8/14/97, *supra* note 184; Allen, *supra* note 180, at 33 (quoting John DeVillars, New England EPA administrator, "I realize that 2005 is an ambitious target. Some may think it too ambitious. But after the clean up of the Boston Harbor, the Charles deserves no less."). This program is consistent with the Charles River's current classification: "B." See FEIR CERTIFICATE, *supra* note 130, at 5.

¹⁹² See MWRA CSO Tour, *supra* note 185.

¹⁹³ See DEP UAA, *supra* note 102, at Table A.

¹⁹⁴ See MWRA CSO Tour, *supra* note 185.

economic impact for changing designated uses, as well as EPA's focus on affordability as the sole means of evaluating economic infeasibility.¹⁹⁵

Prior to 1997, all bodies of water in Massachusetts were designated as at least Class B—fishable/swimmable.¹⁹⁶ Thus, for MWRA to continue any CSO discharges and achieve the two-thirds savings for its ratepayers, MWRA would have to convince EPA that further efforts to decrease CSO impacts would cause substantial and widespread social and economic impacts.¹⁹⁷

B. *The Final MWRA Plan*

At different discharge sites, MWRA experiences as many as forty to fifty discharges per year.¹⁹⁸ In total, throughout the MWRA service district, there are sixty-seven active CSO discharge sites.¹⁹⁹ This number includes discharges from south of Boston, in Quincy and Dorchester Bay, to the North End of Boston at Prison Point, and along the Charles River.²⁰⁰ Early estimates of MWRA CSO events were as high as 7 billion gallons of untreated sewage per year.²⁰¹

Under the Final Facilities Plan, MWRA will capture and treat 99.6% of all CSO volumes, reducing untreated discharges by ninety-two percent.²⁰² Of the remaining discharges, MWRA will treat over ninety percent of CSO discharges.²⁰³ MWRA will eliminate all dis-

¹⁹⁵ See *supra* note 179 and accompanying text.

¹⁹⁶ See MASSACHUSETTS DEP, FINAL ADMINISTRATIVE DETERMINATION FOR CSO IMPACTED WATER WITHIN THE MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA) SEWER SERVICE AREA 1 n.3 (1997) [hereinafter DEP FINAL FEIR APPROVAL]. The Charles River never meets this classification, even during dry weather. See FEIR CERTIFICATE, *supra* note 130, at 5.

¹⁹⁷ See 40 C.F.R. § 131.10(g)(6) (1999); *supra* notes 141–45, 176 and accompanying text.

¹⁹⁸ See MWRA CSO Tour, *supra* note 185.

¹⁹⁹ See Interview with Virginia Renick, MWRA (Feb. 27, 1999) [hereinafter Renick Interview, 2/27/99]. The MWRA FEIR indicated that MWRA originally had 81 CSO discharge sites. See MWRA FEIR, *supra* note 2, at 2–1. Since then, MWRA discovered one more site, for a total number of 82 sites. See Renick Interview, 2/27/99, *supra*. MWRA efforts under its control plan to date are responsible for reducing the total number of active sites to 67. See *id.*

²⁰⁰ See MWRA FEIR, *supra* note 2, at 2–1.

²⁰¹ See Thomas Salvage, Note, *Boston Harbor: The Anatomy of a Court-Run Cleanup*, 22 B.C. ENVTL. AFF. L. REV. 365, 376 (1995).

²⁰² See DEP Tentative FEIR Approval, *supra* note 180, at 3 (noting capture and treatment of 99.6% of total CSO volume, and 92% reduction in volume of untreated CSOs); FEIR CERTIFICATE, *supra* note 130 (noting MWRA plan will reduce “discharges into [Boston Harbor and its tributaries] by 99.6 percent”). Previous estimates of total discharge volume in 1992 were approximately 1.5 billion gallons. See Wheatly, *supra* note 8, at 194.

²⁰³ See DEP Tentative FEIR Approval, *supra* note 180, at 3 (noting 92% treatment of remaining CSOs).

charges in sensitive uses areas such as North and South Dorchester Bays, the Neponset River, and Constitution Beach.²⁰⁴ Ninety-five percent of all flows will reach MWRA's POTW at Deer Island.²⁰⁵

An example of the proposed new treatment/storage plan is under development at Cottage Farm.²⁰⁶ This facility is located on the Cambridge side of the Charles River, midway between the Watertown Dam and the Charles River Dam—areas most commonly associated with collegiate sailing and rowing competitions and serving as a scenic backdrop to the Hatch Shell, a popular outdoor arena which hosts concerts such as the Boston Pops during the Fourth of July fireworks celebration.²⁰⁷ Cottage Farm is one of nineteen CSO sites that discharge into the Charles River during wet-weather events.²⁰⁸ Currently, the plant operates as a diversion facility, treating and discharging excess flows from the upstream CSS network.²⁰⁹ When the upstream capacity is insufficient to convey the combined flows to MWRA's POTW at Deer Island, the plant uses its 1.3 million gallon concrete treatment basins as detention facilities.²¹⁰ In combining the detention and CSS capacities, the Cottage Farm facility prevents flows during all but twenty storms in the average year.²¹¹ When discharge events occur, the Cottage Farm facility treats the combined stormwater and sewage by screening, disinfection, and sedimentation before the discharge reaches the Charles River.²¹² This facility does not treat the removed solids.²¹³ Solids are reintroduced into the CSS system for treatment at Deer Island.²¹⁴

MWRA's final plan, including separation of upstream sources and improvements to the existing facility, will cut the average yearly discharges from almost twenty to seven discharges per year and will add a step to dechlorinate the treated CSOs.²¹⁵ In evaluating addi-

²⁰⁴ See *id.*; DEP UAA, *supra* note 102, at Table A. These areas are located in East Boston or along the south shore of Boston Harbor. Historically, these have been associated with recreational swimming as well as shellfish harvesting. See *id.*

²⁰⁵ See MWRA FEIR, *supra* note 2, at 7-24. This percentage is estimated for 2008, up from 68% treatment at the POTW in 1988. See *id.*

²⁰⁶ See *id.* at 25-55.

²⁰⁷ See *id.* at 4-41, 4-44, 25-55.

²⁰⁸ See *id.* at 4-41.

²⁰⁹ See MWRA CSO Tour, *supra* note 185.

²¹⁰ See MWRA FEIR, *supra* note 2, at 25-70.

²¹¹ See *id.* at 25-70.

²¹² See *id.*

²¹³ See MWRA CSO Tour, *supra* note 185.

²¹⁴ See *id.*

²¹⁵ See DEP UAA, *supra* note 102, at Table A; Renick Interview, 2/27/99, *supra* note 193; see

tional control measures, MWRA deemed additional controls infeasible.²¹⁶ MWRA found that relocation was not a feasible alternative because there are no less-sensitive receiving water areas in the vicinity of the outfall from the Cottage Farm facility.²¹⁷ MWRA also found that further separation was infeasible in view of the large watershed contributing to the Cottage Farm facility.²¹⁸ Finally, MWRA's evaluation of total elimination revealed that a facility of sufficient storage volume for complete elimination of CSOs must be almost seven times larger than the existing facility, increasing the costs by over \$60 million.²¹⁹ In contrast, MWRA plans to spend just over \$3 million.²²⁰

The MWRA improvements will reduce total volumes of discharge at Cottage Farm from an original 1.5 billion gallons, and the current 110 million gallons, to 26.7 million gallons.²²¹ All discharges will be screened, treated with chlorine, and dechlorinated prior to discharge.²²²

C. *The Cost of the Final Plan to Rate Payers*

Under the MWRA's Final Combined Sewer Overflow Facilities Plan and Environmental Impact Report (FEIR), the total planning and construction cost will amount to \$451 million, divided among twenty-five individual projects.²²³ Of the eighty-two original CSO discharge sites, thirty will have been closed (no discharges), forty-six will be reduced to a minimal number of CSO events per year (no more than four per average year), and five will have treated discharges (as at Cottage Farm).²²⁴ In so doing, MWRA will eliminate discharges in all sensitive use areas.²²⁵ All of these improvements are in addition to

also Peter J. Howe, *Price Enters Fray on How Clean to Get Charles*, BOSTON GLOBE, Dec. 16, 1997, at B3.

²¹⁶ See MWRA FEIR, *supra* note 2, at 25-56, 25-82.

²¹⁷ See *id.* at 25-56.

²¹⁸ See *id.* at 25-56.

²¹⁹ See *id.* at 25-75.

²²⁰ See *id.* at 25-75.

²²¹ See MWRA FEIR, *supra* note 2, at 25-82, 25-83, 25-84; MWRA CSO Tour, *supra* note 185.

²²² See MWRA FEIR, *supra* note 2, at 25-82, 25-83, 25-84; MWRA CSO Tour, *supra* note 185.

²²³ See MWRA FEIR, *supra* note 2, at 1-1; DEP UAA, *supra* note 102, at Table A; see also Peter J. Howe, *MWRA Told to Step Up Overflow Reduction*, BOSTON GLOBE, Nov. 1, 1997, at B3 (total cost about \$450 million).

²²⁴ See MWRA CSO Tour, *supra* note 185.

²²⁵ See *supra* note 204 and accompanying text.

over \$200 million spent by the Commonwealth to address water quality improvements in and along the Charles River under the CWA.²²⁶

Final impacts to ratepayers for these improvements will be passed on in the sewer and wastewater bills.²²⁷ According to MWRA projections, an improvement of \$10 million translates into a one dollar per year increase per household for its ratepayers.²²⁸ On the basis of the work proposed in MWRA's FEIR, EPA and MWRA estimate that annual costs for MWRA wastewater customers will reach as much as \$723 per household.²²⁹ These estimates attribute ninety-three dollars of that amount to CSO improvements.²³⁰

D. Approval

In October 1997, DEP approved MWRA's LTCP subject to development and approval to Variance areas.²³¹ On the basis of that plan, DEP recommended Variance for MWRA's permits for discharges in the Charles River and the Mystic River Basin, as well as changes in designated use, from Class B and SB to Class B_{CSO} and SB_{CSO} for the remaining discharge areas where the MWRA LTCP does not propose CSO elimination.²³²

DEP's recommendations reflect the contribution of upstream pollution sources to the overall water quality of the Charles River, the continued challenges of stormwater discharges which would continue even after separation, and the economic infeasibility of total storage.²³³ DEP found that MWRA met the requirements for water quality stan-

²²⁶ See Peter J. Howe, *Renaissance on the Charles*, BOSTON GLOBE MAGAZINE, Oct. 5, 1993, at 29.

²²⁷ See, e.g., EPA Concurrence, *supra* note 135, at 3-4. MWRA directly supplies cities and towns with sewer service, drinking water, or both. See MWRA, *Water and Sewer Rates* (visited Feb. 22, 1999) <<http://www.mwra.com/org/html/rates.htm>>. These cities and towns pay MWRA directly for its services. See *id.* Residents of the subscribing areas then pay the towns for their services. See *id.* Regardless of the intermediary/municipalities, residents of MWRA-supplied cities and towns are the ultimate customers ("ratepayers") of MWRA's CSO plan. See *id.*

²²⁸ See Howe, *supra* note 215, at B3.

²²⁹ See EPA Concurrence, *supra* note 135, at Attachment A1.

²³⁰ See Letter from Michael J. Hornbrook, Program Director, MWRA, to Steven G. Lipman, Boston Harbor Coordinator, DEP 2 (December 1, 1997) (regarding MWRA CSO Control Plan—Ratepayer Impact).

²³¹ See DEP FINAL FEIR APPROVAL, *supra* note 196, at 2-3.

²³² See DEP UAA, *supra* note 102, at 4-5. The remaining areas are the Boston Inner Harbor, Chelsea Creek, Island End, Little Mystic Channels, and tidal portions of the Mystic and Charles Rivers. See *id.*

²³³ See *id.* at 10.

dards under both the Presumption and the Demonstration means.²³⁴ The Demonstration showing was met because of the significant water quality hazards existing independent of CSOs and MWRA's reduction of CSO impacts.²³⁵ These conclusions were supported by extensive studies of the MWRA region conducted by MWRA since 1992.²³⁶ Furthermore, the MWRA plan addressed future expansion if necessary.²³⁷ MWRA's implementation of the NMCs addresses the technology requirements of the CWA.²³⁸

After approval, DEP submitted its findings to EPA as part of its UAA for final approval of designated use changes.²³⁹ EPA concurred that MWRA had sufficiently established an effective CSO control policy as required for the NPDES permit and that it had shown substantial widespread social and economic impact.²⁴⁰

Finally, DEP issued final Variance for MWRA's CSO control plan in the Charles River basin.²⁴¹ DEP issued this Variance for two years to give MWRA time to investigate the feasibility of additional CSO controls along the Charles.²⁴² DEP is in the process of issuing a similar Variance for the Alewife/Upper Mystic River.²⁴³

²³⁴ See *id.* at 14; *supra* notes 80, 83 and accompanying text.

²³⁵ See DEP UAA, *supra* note 102, at 14; *supra* notes 80, 83 and accompanying text; see also MWRA FEIR, *supra* note 2, at 7-2, 7-3, 7-15.

²³⁶ See MWRA FEIR, *supra* note 2, at 7-2, 7-3, 7-15.

²³⁷ See *id.* at 7-31; *supra* note 83 and accompanying text.

²³⁸ See FEIR CERTIFICATE, *supra* note 130, at 5; Renick Interview, 2/27/99, *supra* note 199; *supra* notes 91-94 and accompanying text. MWRA has met the NMCs except that the maximization of treatment at the POTW is impossible until MWRA completes and activates the 99 mile outfall pipe for MWRA's Deer Island facility; and MWRA will not complete floatables control until further study of the effectiveness of underflow baffles at nontreatment CSO sites. See Renick Interview, 2/27/99, *supra* note 199; see also DEP Tentative FEIR Approval, *supra* note 180, at 5 (discussing MWRA plans to address floatables); *Discharge Permits: Permit for \$3.9 Billion Treatment Plant in Massachusetts Called "Toughest" in U.S.*, *supra* note 8 (detailing Deer Island Outfall Pipe permitting process and outfall facility).

²³⁹ See DEP UAA, *supra* note 102, at 1.

²⁴⁰ See EPA Concurrence, *supra* note 135, at 1.

²⁴¹ See DEP, FINAL (9/2/98) VARIANCE FOR THE MWRA CSO CONTROL PLAN IN THE CHARLES RIVER BASIN 1 (1998).

²⁴² See *id.*; see also *supra* notes 121, 130 and accompanying text.

²⁴³ See Mass. DEP, Notice of Availability MWRA Combined Sewer Overflow Plan Alewife

VI. A DIFFERENCE OF OPINION

A. *The Controversy*

Although EPA and DEP both approved a designation of Variance to MWRA for the Charles River Basin and a change in designated use for the remaining CSO-impacted areas, DEP and EPA disagree over the methods of calculating such impact.²⁴⁴ EPA insists that the impact should be evaluated based on an "ability to pay" basis, calculating the maximum per capita costs that can be imposed on the community; DEP insists that the standard should be based on a cost-benefit analysis of the results achieved for the dollars spent using a "knee of the curve" analysis.²⁴⁵

The controversy at issue is how to interpret 314 CMR 4.03(4), which allows continued CSO discharge after a showing that complete sewer separation and CSO elimination would cause "substantial and widespread economic and social impact," and 40 C.F.R. §131.10(g)(6), which outlines the federal requirements for allowing changes in designated uses that announce the same standard.²⁴⁶

B. *EPA's "Ability to Pay" Analysis*

EPA's 1994 CSO Policy introduces a "knee of the curve" analysis to determine how a permittee should evaluate abatement alternatives.²⁴⁷ This "knee of the curve" analysis is detailed on a technological basis in an article by David S. Bailey, who at the time of authorship was a senior attorney and a scientist with the Environmental Defense Fund and member of a CSO work group established by EPA.²⁴⁸ His article

Brook/Upper Mystic River DEP Administrative Determination Relative to Water Quality Standards, available from DEP: One Winter Street, 6th Floor, Boston, MA 02108.

²⁴⁴ See *supra* notes 179, 231–32, 240–43 and accompanying text.

²⁴⁵ See DEP Response to EPA, *supra* note 151, at 2; see also *supra* note 179 and accompanying text. "In recent discussions with EPA, [DEP] staff have reiterated the use of 'affordability' for determining whether there is widespread social and economic impact for approval of UAAs. When asked for written guidance explicitly stating this policy, EPA could not provide a specific citation but promised to send something this week. Because EPA must concur with the UAA, we will remain in conflict if DEP uses its facility planning/'knee of the curve' and EPA uses affordability to conclude there is widespread social and economic impact. If EPA has flexibility—and flexibility was, after all, the cornerstone of the 1994 Policy—then I suspect we can arrive at a mutually acceptable position." DEP Response to EPA, *supra* note 151, at 2.

²⁴⁶ DEP Response to EPA, *supra* note 151, at 2.

²⁴⁷ See *Combined Sewer Overflow (CSO) Control Policy*, 59 Fed. Reg. 18,688, 18,693 (1994).

²⁴⁸ See David S. Bailey, *The Light at the End of the Sewer: How Interested Parties Negotiated*

details a study comparing the actual CSO discharges over forty years to the design standards for sizing CSO facilities.²⁴⁹ The study concluded that eighty-five percent capture was a "break point."²⁵⁰ According to the study, expenditures to capture more than this amount of CSO discharges quickly became disproportionate to achieved controls.²⁵¹ For example, construction of an additional twenty percent in storage capacity only achieved a five percent decrease in CSO emissions over one year.²⁵²

Although Bailey's article applies this analysis in evaluating technical alternatives, the results of the study also represent the economic challenges when one considers the additional costs associated with construction of the additional capacity.²⁵³ In fact, the 1994 CSO Policy expressly states that in establishing the LTCP for the operator, the proposal should include an analysis to determine "where the increment of pollution reduction achieved in the receiving water diminishes compared to the increased costs."²⁵⁴ This consideration reflects the reality that designing CSO systems to avoid discharges in extreme, unusual wet-weather events (such as events over two inches in volume) is inefficient—especially when, (1) the impact of non-CSO sources on water quality is recognized; and (2) these unusual wet-weather events occur at times when swimming or fishing are unlikely uses.²⁵⁵

However, according to EPA, this method of cost-effective evaluation is inappropriate for establishing the infeasibility of attaining a designated use, even though it is part of the LTCP.²⁵⁶ EPA states that

a Consensus Solution to the Combined Sewer Overflow Problem, in NATIONAL WATER RESOURCES REGULATION: WHERE IS THE ENVIRONMENTAL PENDULUM NOW? 204 (1994).

²⁴⁹ See *id.*

²⁵⁰ *Id.*

²⁵¹ See *id.*

²⁵² See *id.* at 206.

²⁵³ See, e.g., MWRA FEIR, *supra* note 2, at 25–84 (noting that the difference in cost between improving the Cottage Farm facility to capture all but four storms per year and stopping all discharges changes the cost from \$27 million to \$66 million—in other words a \$39 million capacity that gets used four times per year).

²⁵⁴ *Combined Sewer Overflow (CSO) Control Policy*, 59 Fed. Reg. 18,688, 18,693 (1994).

²⁵⁵ See MCGHEE, *supra* note 3, at 268; Bailey, *supra* note 242, at 207.

²⁵⁶ See EPA Concurrence, *supra* note 135, at 3. "It would not be appropriate . . . for a state to base a UAA entirely on a finding that further CSO controls are beyond the 'knee' of a cost-performance curve. The 'substantial and widespread social and economic impact' standard is not a cost-benefit test. While EPA encourages consideration of cost-performance curves as part of the development of CSO control plans, such information cannot by itself justify a change in water quality." *Id.*

a cost-benefit or cost-effective analysis is appropriate for choosing between technologies and control strategies if a permittee cannot eliminate all CSOs, but it is not the appropriate mechanism for determining the level of control generally necessary for the permittee on a system-wide basis.²⁵⁷

EPA does not mention this distinction in its 1994 CSO Control Policy and according to DEP, it was not considered by EPA while DEP developed its own CSO Policy.²⁵⁸ This discrepancy was not highlighted until EPA's public comment letter to DEP's Draft CSO Policy and EPA's concurrence on Variance for the Charles River.²⁵⁹

EPA's concurrence details its calculation for "substantial and widespread economic and social impacts."²⁶⁰ According to EPA, economic impact is a factor of affordability based on local unemployment rates, municipal bond ratings, and debt level, among other factors.²⁶¹ As a sample analysis, EPA attached sample calculations for Boston and for Chelsea, a city across the harbor from Boston but within the MWRA district.²⁶² Under its analysis, EPA determined that wastewater charges in total will reach 2.28% of the median household income (MHI) for Chelsea and 1.65% in Boston.²⁶³ EPA calculated combined sewer and water rates of 3.79% and 2.98% for the communities, respectively.²⁶⁴ For MWRA service districts, the average sewer cost will be 1.25% of MHI and the combined water and sewer rates will be 2.1%.²⁶⁵

²⁵⁷ See *id.*; see also EPA Comments, *supra* note 179, at 2. "A cost-benefit analysis is appropriate for choosing between technologies and control strategies if a permittee cannot eliminate all CSOs, but it is not the appropriate mechanism for determining the level of control that is feasible on a system-wide basis. Rather, permittees must implement all affordable CSO controls necessary to comply with water quality standards." EPA Comments, *supra* note 179, at 2.

²⁵⁸ See DEP Response to EPA, *supra* note 151, at 1; see also Mee, *supra* note 77, at 244 ("The desire to satisfy all participants may tempt an agency that sponsors negotiated rule making to paper over differences when it produces the final rule or policy.").

At the time these regulatory revisions were promulgated, the Department clearly articulated its rationale to EPA as well as to potentially affected permittees, environmental organizations, and other interested parties. Ample opportunity for comment was afforded at that time, and neither EPA nor any interested party adversely commented upon DEP's approach to these revisions. In fact, EPA *supported* the proposed revisions, and DEP and EPA presented a unified front at public presentations.

DEP Response to EPA, *supra* note 151, at 1.

²⁵⁹ See *supra* notes 256-57 and accompanying text.

²⁶⁰ EPA Concurrence, *supra* note 135, at 3, Attachments A, B.

²⁶¹ See *id.* at Attachments A 2-3, B 2-3.

²⁶² See *id.* at Attachments A, B.

²⁶³ See *id.* at 3.

²⁶⁴ See *id.*

²⁶⁵ See EPA Concurrence, *supra* note 135, at 4.

The EPA example then compared these results to guidelines published in EPA's Interim Economic Guidance for Water Quality Standards (EPA Economic Guidance).²⁶⁶ EPA's Economic Guidance suggests two tests: a screener test to quantify the amount of the impact, and a secondary test to evaluate the community's ability to afford the impact.²⁶⁷ The screener test simply takes the combined cost of sewer and water services as a percentage of the MHI.²⁶⁸ A value greater than two percent is considered a large impact and is a candidate for a finding of substantial and widespread impact.²⁶⁹

The secondary test weighs six factors on a scale from one to three with one representing economic weakness and three representing economic strength.²⁷⁰ The six factors are: (1) bond rating; (2) debt per capita; (3) unemployment rate; (4) MHI; (5) property tax revenue as a percentage of market value; and (6) property tax collection rate.²⁷¹

When the screening test was applied to MWRA's ratepayers, the results were above the two percent listed in EPA's Economic Guidance.²⁷² The higher secondary score was a 2.2.²⁷³ The combination of these test results, when applied to EPA's Economic Guidance, indicated a likelihood of substantial and widespread social impacts.²⁷⁴ Therefore, EPA's Economic Guidance calls for additional consideration of factors indicating a change in the socioeconomic conditions of the community—such as the effect of increased rates on property values and whether the additional cost burdens would threaten local businesses or deter new businesses from locating in the community.²⁷⁵ In total, considering the results of the screening test and the secondary test, and noting MWRA's pending improvements to comply with the Safe Drinking Water Act,²⁷⁶ EPA concluded that further CSO controls would impose substantial and widespread social and economic impacts.²⁷⁷

²⁶⁶ See *id.* at Attachments A, B; see generally EPA ECONOMIC GUIDANCE, *supra* note 178.

²⁶⁷ See EPA ECONOMIC GUIDANCE, *supra* note 177, at 2-2, 2-14, 2-16, 2-17.

²⁶⁸ See *id.* at 2-14.

²⁶⁹ See *id.* at 2-15.

²⁷⁰ See *id.* at 2-17, 2-24.

²⁷¹ See *id.* at 2-18, 2-19, 2-20, 2-21.

²⁷² See EPA Concurrence, *supra* note 135, at Attachments A 2-3, B 2-3.

²⁷³ See *id.* at Attachment B 3.

²⁷⁴ See EPA ECONOMIC GUIDANCE, *supra* note 178, at 2-29.

²⁷⁵ See *id.* at 4-2, 4-3, 4-4.

²⁷⁶ 42 U.S.C. § 300f-q (1994).

²⁷⁷ See EPA Concurrence, *supra* note 135, at 2, Attachments A 3, B 3.

C. DEP's Cost-Effectiveness Method

DEP's position reflects a similar concern for the overall costs of CSO improvements, but factors into the evaluation the actual water quality benefit achieved per dollar spent.²⁷⁸ This analysis is the same as the "knee of the curve" analysis employed by EPA in evaluating abatement alternatives under the 1994 CSO Policy.²⁷⁹

DEP argues that focusing solely on the affordability of the measures could result "in dramatic cost increases to CSO permittees in Massachusetts, with little or no receiving water benefits."²⁸⁰ According to DEP, this is especially true where CSOs contribute a minor percentage of total pollutant loads in the receiving body.²⁸¹ DEP's own research, based on water quality modeling, shows that alternative CSO control measures can provide equivalent or better water quality at a reduced cost when compared to sewer separation.²⁸² Such results reflect the stormwater discharges that separation would fail to eliminate and, unlike combined discharges at CSO sites such as Cottage Farm, would be discharged without treatment.²⁸³

For example, MWRA calculations indicate that elimination of all CSO events on the Charles River would only reduce suspended solid and biochemical oxygen demand in the river by fifteen percent, indicating that approximately eighty-five percent of water quality degradation in the Charles River comes from non-CSO sources.²⁸⁴ The minimal impact of additional CSO discharges on water quality reflects the dilution of sewage that occurs with the extreme wet-weather events that are required to trigger CSOs as CSS systems are improved.²⁸⁵

²⁷⁸ See DEP UAA, *supra* note 102, at 10. Based on EPA's 1994 CSO Policy, DEP considers this criterion to be met "when the costs of sewer separation are shown to be excessive, as compared to the water quality benefits to be achieved." *Id.*

²⁷⁹ See *supra* notes 249-52 and accompanying text.

²⁸⁰ DEP Response to EPA, *supra* note 151, at 2-3.

²⁸¹ See FEIR CERTIFICATE, *supra* note 130, at 5. The Secretary of Environmental Affairs stated that MWRA's plan "makes good environmental and economic sense, given that achieving a swimmable/fishable Charles River by 2005 requires greater emphasis to be placed on the cost-efficient cleanup of non-CSO pollution sources in the basin, with a revisiting of the CSO issue in the future to see if further steps prove feasible at that time." *Id.*

²⁸² See *supra* note 151 and accompanying text.

²⁸³ See DEP CSO GUIDANCE, *supra* note 32, at 7. In considering the water quality benefits of sewer separation, the permittee should consider "potential interactive and overlapping pollution sources such as discharge from the storm drain system after separation . . ." *Id.*

²⁸⁴ See MWRA FEIR, *supra* note 2, at 25-82.

²⁸⁵ See *id.*; see also Upper Chattahoochee Riverkeeper Fund, Inc. v. City of Atlanta, 986 F.

As DEP explained in responding to public comments on its CSO Policy, "[t]he focus of the alternatives analysis and cost-benefit analysis is to effect CSO controls that attain the highest water quality attainable while at the same time not expending public funds on CSO controls that will result in little or no benefit to a receiving water."²⁸⁶

D. *Absence of Clear Guidance*

According to EPA's own statements, while there is "extensive guidance" supporting most of the regulatory requirements, "[n]one of this guidance, however, deals extensively with the economic considerations."²⁸⁷ To address this deficiency, EPA published an Economic Guidance outlining a proposed method that states could use in calculating substantial and widespread social and economic impacts.²⁸⁸ However, the methodology outlined in this Guidance is not exclusive, and states are responsible for determining how and when substantial and widespread social and economic impacts are shown.²⁸⁹

VII. TWO CONCLUSIONS, THE SAME RESULT: WHAT'S THE DIFFERENCE?

A. *A Successful Result for the Environment and Ratepayers*

Above all, EPA's approval of DEP's UAA, the promulgation of effective federal and state CSO policies, MWRA's elimination of ninety-two percent of untreated CSOs, and treatment of ninety-two

Supp. 1406, 1411 (N.D.Ga. 1997) (noting estimates of actual sewage content in CSOs to be between one and five percent).

²⁸⁶ DEP, RESPONSES TO PUBLIC COMMENTS 3 (Aug. 11, 1997) (regarding DEP Draft CSO Policy) [hereinafter DEP RESPONSES TO PUBLIC COMMENTS].

²⁸⁷ EPA ECONOMIC GUIDANCE, *supra* note 171, at cover letter.

²⁸⁸ *See id.*

²⁸⁹ *See id.* at 1-1, 1-11.

This guidance is presented to assist States and EPA Regional Offices, along with other interested parties, in understanding the economic factors that *may* be considered, and the types of tests that *can* be used to determine: (1) if a designated use cannot be attained, (2) if a variance to an individual discharger can be granted, or (3) if degradation of high-quality water is warranted. The regulatory requirement that *must* be met is that attaining a designated use or obtaining a variance would result in substantial and widespread economic and social impacts. The regulatory requirement for antidegradation is that it *must* be shown that lower water quality is necessary to accommodate important social and economic development. This guidance provides a framework for making these considerations.

Id. at cover letter (emphasis in original).

percent of continuing CSOs at two-thirds the original estimated price, illustrate the tremendous efforts and effectiveness of cooperation among EPA, DEP, and MWRA.²⁹⁰ By introducing cost considerations, however calculated, the ratepayers of Massachusetts avoid paying triple the expense for collection of only 0.4% of pollution.²⁹¹ In view of the improbability of fishing and swimming during these discharge events and the non-CSO pollutants associated with such storm events such as overland flow, nonpoint sources, and ambient pollution from upstream sources, the solution does not significantly compromise the water quality goals of the CWA.²⁹²

B. *Contrast of Cost-Effectiveness with Traditional Cost-Benefit Analyses*

Cost-benefit considerations in any environmental regulations raise specters of concern among those who consider the preservation of irreplaceable natural resources the paramount national concern.²⁹³ Even those who recognize the value of some cost-benefit analysis also recognize that these analyses often fail to quantify properly the benefits of a clean environment, which are far-reaching and not readily quantifiable compared to the easily assessed costs to a regulated industry.²⁹⁴ Skeptics argue that a cost-benefit analysis artificially limits alternatives, fails to compare the cost of not polluting versus the cost of clean up, and is susceptible to political pressure.²⁹⁵ Most importantly, cost-benefit detractors charge that this analysis is calculated in ignorance of the real intentions behind the regulations.²⁹⁶ All of these challenges are merited in most cost-benefit analyses, but are absent in the cost-effective analysis.²⁹⁷

Unlike traditionally prescribed cost-benefit analyses which force the regulator to justify the regulation by quantifying the economic

²⁹⁰ See discussion *supra* Sections III.A, V.B.

²⁹¹ See *supra* notes 202–05, 223 and accompanying text.

²⁹² See *supra* notes 280–81, 284–85.

²⁹³ See Richard A. Liroff, *Cost-Benefit Analysis in Environmental Regulation: Will it Clear the Air or Muddy the Water?*, in *COST-BENEFIT ANALYSIS AND ENVIRONMENTAL REGULATIONS: POLITICS, ETHICS, AND METHODS* 3 (1982).

²⁹⁴ See Margot W. Garcia & Gregory A. Daneke, *The Role of Public Involvement in Social Impact Assessment: Problems and Prospects*, in *PUBLIC INVOLVEMENT AND SOCIAL IMPACT ASSESSMENT* 162 (Gregory A. Daneke et al., ed. 1983).

²⁹⁵ See *id.*

²⁹⁶ See NORMAN J. VIG & MICHAEL E. KRAFT, *ENVIRONMENTAL POLICY IN THE 1990s* 149 (1990).

²⁹⁷ See *id.* at 159–60; Liroff, *supra* note 293, at 3.

benefits of environmental improvement, the methods of DEP and EPA both presume a common goal: the attainment of WQSS.²⁹⁸

Since DEP's analysis maintains the water quality goals, it is better characterized as a cost-effective method, finding ways to minimize the costs of achieving solid environmental goals.²⁹⁹ Cost-effective methods rely on costs only as a method of evaluating the best means of achieving a goal, not for defining the goal.³⁰⁰

Since the goal of DEP and EPA plans is water quality benefits, the traditional offsetting of environmental benefit is not introduced.³⁰¹ Instead, DEP's method merely introduces additional flexibility in obtaining that goal rather than focusing all available efforts on one type of discharge.³⁰²

Varied environmental settings have shown the advantages of cost-effective planning.³⁰³ Focused on attaining air and WQSS, a study found that implementation of cost-effective considerations by equalizing the marginal costs could save thirty to forty percent, with some sectors saving as much as ninety percent.³⁰⁴ Analysis of marginal costs has shown that some industries pay as much as thirty times the amounts paid by other industries to achieve the same pollutant abatement.³⁰⁵ This is why many consider the introduction of cost-benefits "organized common sense."³⁰⁶

²⁹⁸ See, e.g., Liroff, *supra* note 293, at 3; DEP RESPONSES TO PUBLIC COMMENTS, *supra* note 280, at 3. DEP affirms that "[t]he overriding goal of CSO planning and the DEP Watershed Initiative is clean water, however, it needs to be understood that the instream water quality is dependent on controlling CSO and non-CSO sources of pollution." DEP RESPONSES TO PUBLIC COMMENTS, *supra* note 286, at 3. Therefore, according to DEP, "[t]he water quality impacts of the range of CSO controls is of critical importance in this regard and must be evaluated in the plan." *Id.*

²⁹⁹ See VIG & KRAFT, *supra* note 296, at 146; Liroff, *supra* note 293, at 2-3.

³⁰⁰ See VIG & KRAFT, *supra* note 296, at 153-54; Liroff, *supra* note 293, at 3.

³⁰¹ See Liroff, *supra* note 293, at 8 (discussing traditional criticism of cost-benefit analysis including the loss of focus on the purpose); *supra* note 298 and accompanying text.

³⁰² See *supra* note 289 and accompanying text.

³⁰³ See VIG & KRAFT, *supra* note 296, at 153-54.

³⁰⁴ See *id.* at 155. Marginal costs are the costs of achieving one unit of pollution abatement. See *id.* at 153-54.

³⁰⁵ See *id.* at 154.

³⁰⁶ *Id.* at 147; Raphael Kasper, *Cost-Benefit Analysis in Environmental Decisionmaking*, 45 GEO. WASH. L. REV. 1013, 1014 (1977).

At some point the feasibility of elimination is ruined because the costs are too high and the additional benefits too low. . . . Who but the most irrational among us could disagree with the advantages of understanding (to some admittedly undefined extent) the costs and benefits of a proposed action and then using that understanding in making decisions.

Kasper, *supra*, at 1014.

C. *Advantages of DEP's Plan*

The principle advantage of the DEP system is that it incorporates all of EPA's Economic Guidance and adds an additional consideration of cost-effectiveness.³⁰⁷ This flexibility is particularly relevant in areas such as the Charles River, where it is widely suspected by state environmental officials that the majority of pollutants are from upstream sources and non-CSO stormwater discharges.³⁰⁸ In these situations, the water quality benefit will be virtually unaltered by additional CSO detention.³⁰⁹ For example, to reduce the CSO events from the Cottage Farm facility in Cambridge³¹⁰ from seven events per year to four would double the cost, yet only achieve a fifteen percent reduction in pollutant emissions such as biochemical oxygen demand and suspended solids.³¹¹

Unfortunately, without the addition of a cost-effectiveness review, the EPA Guidance prescribes a minimum limit that must be spent in clean-up efforts, regardless of the resulting water quality benefits.³¹² EPA's estimates established that total CSO control will be a multibillion dollar venture.³¹³ It is therefore unlikely that a CSS community could clean up CSOs without reaching the cap.³¹⁴ Thus, while EPA's

³⁰⁷ See DEP CSO POLICY, *supra* note 18, at 7. DEP's Policy notes that:

[DEP] will make a finding that sewer separation will cause widespread social and economic impact when a project exceeds the affordability guidelines included in the EPA *Economic Guidance for Water Quality Standards*; or when costs are determined to be excessive when compared to water quality benefits to be achieved; or when alternative CSO controls are demonstrated to provide superior environmental benefits to a receiving water in supporting existing and proposed uses and associated water quality standards.

Id. Since both DEP and EPA, therefore, include affordability in their reviews of infeasibility, an independent review of the advantages of considering affordability is unnecessary. See *id.*

³⁰⁸ See Howe, *supra* note 215, at B3 ("State environmental officials increasingly think that the money that *could* be spent on increasing CSO control in the Charles could produce much bigger environmental benefits if spent, for example, to collect and treat river-bound runoff from city streets which can cause as much pollution as sewerage."); see also MCGHEE, *supra* note 3, at 268 (noting that receiving bodies are so contaminated by runoff from the first flush of overland and stormwater flows that treatment of point sources appears unreasonable).

³⁰⁹ See *supra* notes 151, 284-85 and accompanying text.

³¹⁰ See *supra* notes 206-07 and accompanying text.

³¹¹ See MWRA FEIR, *supra* note 2, at 25-82.

³¹² See *supra* note 280 and accompanying text.

³¹³ See *supra* note 29 and accompanying text.

³¹⁴ See *supra* notes 29, 261-65; see also Wheatly, *supra* note 8, at 195 (raising social justice issues that only "rich communities" will be able to afford the required improvements). Many cities have estimated CSO control costs higher than the amounts found by EPA to constitute widespread social and economic impacts in Boston. See Peter Crane Anderson, Note, *The CSO*

position is easier on ratepayers than no limitation, the fact remains that all residents in CSS communities should prepare to pay two percent of their income for these improvements.³¹⁵

While this reality is not overly burdensome, it fails to account for further expenditures.³¹⁶ If the additional percentage of household income in rates is a substantial economic and social harm now, what will it be in the future—certainly not less?³¹⁷ Allowing the exemption for minimal benefit frees these funds for other environmental clean-up efforts, such as MWRA's efforts to address stormwater discharges, yielding a significant improvement in water quality at the same cost.³¹⁸

However, the funds for these improvements must come at a cost in addition to MWRA's efforts.³¹⁹ Thus, projected and unforeseen environmental dangers not addressed by CSO abatement measures will have to come from a percentage of the ratepayers' income at a cost beyond the rate EPA considers a substantial economic and social impact.³²⁰ If instead, DEP's position replaces EPA's "affordability" analysis in other communities, the CSO Control measures may be stopped short of the substantial impact rate while still achieving, as a percentage, large improvements—thus, leaving additional ratepayer resources for other environmental projects that would result in greater improvements in water quality per dollar spent.³²¹

Sleeping Giant: Combined Sewer Overflow or Congressional Stalling Objective? 10 VA. ENVTL. L.J. 371, 394 (1991) (estimated CSO control costs, per capita: Rochester, New York—\$3100; Richmond, Virginia—\$3200; San Francisco, California—\$1000).

³¹⁵ See *supra* notes 29, 267–71; see also Wheatly, *supra* note 8, at 195; Anderson, *supra* note 314, at 394.

³¹⁶ See Liroff, *supra* note 293, at 8.

³¹⁷ For example, MWRA plans to spend \$1.7 billion on improving drinking water quality. See MWRA, *A Letter from Doug MacDonald Regarding Filtration for the MWRA Water Supply* (visited Feb. 10, 1999) <<http://www.mwra.state.ma.us/org/html/letter.htm>>. The expenses, passed on to ratepayers, will add to the total burden and exceed the current rates. See *id.* Since EPA's review of sewer and water rates are combined in calculating the economic impacts, *supra* notes 254–55, these expenditures should be, and were, included in the impact analysis by EPA but do not appear as a consideration in EPA's Economic Guidance, *supra* note 178. See EPA Concurrence, *supra* note 135, at 1 (alluding to MWRA costs under the Safe Drinking Water Act).

³¹⁸ See Liroff, *supra* note 293, at 8; *supra* notes 280, 308 and accompanying text.

³¹⁹ See *supra* note 317 and accompanying text.

³²⁰ See *supra* notes 266–77, 317 and accompanying text.

³²¹ See *supra* notes 151, 280, 284–85, 308 and accompanying text; see also VIG & KRAFT, *supra* note 296, at 146 (describing a failure to consider the most cost-effective means of achieving a set environmental goal as "wasteful"); Liroff, *supra* note 293, at 2–3 (noting that one view of cost-effectiveness in environmental decisionmaking is that it protects "scarce public resources").

D. *Revisiting Consensus*

Regardless of the benefit of considering cost-effectiveness, EPA recognizes the need to clarify its analysis for other communities.³²² As DEP points out in its responses to EPA's initial assertions on this issue, permit applicants are investing millions of dollars just in planning these expenditures.³²³ Especially with MWRA, which has burdened its ratepayers with high cost increases as part of the Boston Harbor cleanup,³²⁴ the need to plan in advance to make the most efficient use of its income has a huge impact on public perception of environmental cleanups and the willingness of the public to put up with environmental regulations and the trickle down (or flood) of costs.³²⁵ By clarifying its position, EPA has taken a big step in minimizing CSO abatement costs.³²⁶

CONCLUSION

This Comment does not suggest that the efforts of MWRA, EPA, and DEP regarding the Boston areas have been unproductive. To the contrary, the success of these efforts is laudable. The lingering problem is in synchronizing the remaining state WQSs and CSO policies in a manner that cleans up the watersheds from CSO pollution but reflects the realities of the limited economic resources—allocating resources among the competing projects in a way that achieves the greatest benefit per dollar spent.

³²² See EPA Concurrence, *supra* note 135, at 2.

³²³ See DEP Response to EPA, *supra* note 151, at 1 (noting that "regulated entities have based CSO design plans costing millions of dollars" in reliance on EPA's earlier support of DEP's position).

³²⁴ See *Boston Harbor: Cost Projections Slashed for Harbor Cleanup*, GREENWIRE, Sept. 9, 1994, at Sect. Air and Water Pollution ("The court-ordered cleanup has already caused MWRA customers to pay some of the highest water and sewer bills in the country."); Allen, *supra* note 180, at 25 ("MWRA customers . . . already pay among the highest water and sewer bills in the country because of the court-ordered harbor cleanup. The average MWRA water and sewer customer pays \$590 a year in service charges, an amount expected to rise 50 to 75 percent by 1999.").

³²⁵ See, e.g., Chacon, *supra* note 188, at 22. Vice President Al Gore reacting to the MWRA plan stated, "[t]his is a workable plan to make the city's water safer and cleaner and to reduce people's water bills." *Id.* John DeVillars, regional administrator for EPA, also stated that the MWRA plan was "an Earth Day present from the administration to the beach-goers and ratepayers around Boston." *Id.*

³²⁶ See *supra* note 323 and accompanying text.