Persistent Localism: New Haven's Role in Intergovernmental Water Pollution Control and Sewage Treatment Programs

Andrea Gelatt
Yale Law School

Follow this and additional works at: http://digitalcommons.law.yale.edu/student_legal_history_papers

Recommended Citation
http://digitalcommons.law.yale.edu/student_legal_history_papers/40

This Article is brought to you for free and open access by the Yale Law School Student Scholarship at Yale Law School Legal Scholarship Repository. It has been accepted for inclusion in Student Legal History Papers by an authorized administrator of Yale Law School Legal Scholarship Repository. For more information, please contact julian.aiken@yale.edu.
Persistent Localism: New Haven's Role in Intergovernmental Water Pollution Control and Sewage Treatment Programs

Andrea Gelatt

Completed as a proposed SAW for Professor Ellickson’s Urban Legal History Course

December 21, 2005
Persistent Localism: New Haven’s Role in Intergovernmental Water Pollution Control and Sewage Treatment Programs

I. Introduction .......................................................................................................................... 3
II. An overview of the development of sewerage in New Haven ............................................. 13
   A. Rationale for the system .................................................................................................. 13
   B. The State of the Harbor .............................................................................................. 15
   C. Construction of the system ......................................................................................... 17
III. Sewage treatment technology .......................................................................................... 20
   A. Wastewater characterization ....................................................................................... 20
   B. Sewage treatment technology .................................................................................... 21
   C. Evolution of sewage treatment technology .................................................................. 23
IV. Legal backdrop—local, state and federal laws, regulations, and institutions affecting New Haven’s sewerage .................................................................................... 25
V. Local control ...................................................................................................................... 32
   A. The East Street Plant .................................................................................................. 32
   B. A short interlude: sewers and local politics ................................................................ 41
VI. Federal control .................................................................................................................. 45
VII. Regional Cooperation ..................................................................................................... 55
   A. Regional instigation ..................................................................................................... 55
   B. Interlocal agreements .................................................................................................... 58
   C. Regionalization with Woodbridge, East Haven, and Hamden .................................... 61
VIII. Conclusions ...................................................................................................................... 65
List of Figures .......................................................................................................................... 70
I. Introduction

The standard story of environmental protection over the twentieth century is one of scattered successes with limited impact until the federal government took steps to solve the most pressing environmental issues. While significant problems remain, federal efforts often made substantial improvements in the nation's air quality and waterways.\(^1\) In the area of water policy before the Clean Water Act, most states had water pollution control programs funded by federal grants that did not successfully improve water quality.\(^2\) By the 1970s, the Americans were becoming more environmentally aware,\(^3\) and Congress realized that a new, more forceful effort was needed to address their concerns. Congress passed the Federal Water Pollution Control Amendments of 1972 (Clean Water Act)\(^4\) and instituted a program of regulated permits for point sources discharging pollutants into U.S. waters.\(^5\) In addition, the Clean Water Act provided

---

\(^1\) PHILIP SHABECOFF, A FIERCE GREEN FIRE: THE AMERICAN ENVIRONMENTAL MOVEMENT 126 (rev. ed. 2003) (["H]istory is likely to record the landmark environmental statutes of the 1970s and 1980s and the new institutions they spawned as the most consequential legacy of the environmental era."). The substantial reduction in the problem of pollution from sewage treatment is considered one of the successes of the Clean Water Act. Id. at 258-59.

\(^2\) Federal support of state programs resulted in lax standards as many states were hesitant to ratchet up controls for fear of driving industry to lenient states – a race to the bottom. WALTER A. ROSENBAUM, THE POLITICS OF ENVIRONMENTAL CONCERN 140 (2d ed. 1977). Early federal water pollution enforcement was modest. It relied on the "conference" system in which relevant participants discussed abatement action, federal officials held hearings and could begin court proceedings if necessary, though officials brought only two court actions through 1971. Id. at 142. States were not very proactive: for example, a U.S. Comptroller General’s study of federal grants for state water treatment facilities showed that the states did not prioritize their demands for funds and left the local governments to seek funds and complete plans for the plants on their own. Id. at 109-10.

\(^3\) The start of nationwide concern for environmental problems is often marked by the date of Rachel Carson’s book, SILENT SPRING (1962).


federal funds for the states to improve treatment levels at publicly owned treatment works (POTWs) – one of the largest problems of water pollution.6

But the story of the regulation of New Haven’s sewage treatment plants is not simply one of increasingly higher levels of governmental intervention, ending at federal oversight. Instead, New Haven’s sewage treatment improved because of institutions and regulation of many different configurations of intergovernmental cooperation: from New Haven’s local government, to interlocal agreements with the surrounding towns, Connecticut’s environmental oversight bodies, interstate cooperation to safeguard the health of the Long Island Sound, and the federal government. Even after the federalization of water pollution control policy, local control was never completely supplanted; for example, New Haven remained in control of the design, planning and construction of its sewage treatment plants. In addition, recently, there has been a resurgence of regional efforts to address water pollution. This paper is the story of the intergovernmental interactions of many types that affected the sewerage7 in New Haven, viewed from the vantage of New Haven’s local government.

Informed by the theory of environmental federalism, supplemented with contributions of local government scholars, this paper seeks to analyze the benefits and drawbacks of each level of institutional control and to use the story of New Haven’s sewerage to provide a case study of the various configurations. The goal of this paper is modest: to highlight the role of the local government and local actors in the development of New Haven’s sewerage and to show the beneficial and negative aspects of the ever present

---

6 SHABECOFF, supra note 1, at 258.
7 For the purposes of this paper, I will refer to the system of sewers and the sewage treatment infrastructure as sewerage, though the term is occasionally used to refer only to the system of sewers, or in older texts occasionally refers to sewage.
local aspect to environmental regulation. As different layers of government issued orders and passed statutes directed at New Haven’s city government and later, at the New Haven Water Pollution Control Authority (WPCA), the city fought back, sometimes successfully, to retain a New Haven flavor to the development. Throughout the paper, the reader will see how this interaction has both improved, but also slowed the development of New Haven’s sewage treatment program, leading to some modest conclusions about the role of local government in environmental protection programs.

New Haven’s sewage treatment system has received some attention over the years. This paper seeks to add to the literature by adding the twentieth century developments in New Haven’s sewerage. In addition, this paper will provide a companion to larger regional stories about water pollution control – fleshing out a corner of the history of the Long Island Sound watershed. Further, it will put the regionalization of New Haven’s sewage treatment system in perspective with the regionalization of the New Haven Water Company, and provide a foil to a paper

---


9 TOM ANDERSON, THIS FINE PIECE OF WATER: AN ENVIRONMENTAL HISTORY OF LONG ISLAND SOUND (2002).

10 For a detailed history of the regionalization of the water company, see generally DOROTHY S. MCCLUSKEY AND CLAIRE C. BENNIT, WHO WANTS TO BUY A WATER COMPANY?: FROM PRIVATE TO PUBLIC CONTROL IN NEW HAVEN (1996).
describing recent moves towards partial privatization of New Haven’s sewage treatment plant.\textsuperscript{11}

The history of sewage treatment in New Haven points to two conclusions, one descriptive, one normative. The development of New Haven’s sewage treatment system has a central theme: funding. The pace and amount of funding determined the speed of design and construction and the quality of upgrades and new plants. Throughout the development of its sewage treatment plants, New Haven was increasingly plagued with cost problems because the state and federal government required its plants to meet higher standards and submit to more oversight. Initially, New Haven was able to finance its sewage treatment system through municipal bonds. Later, the federal government partially funded New Haven’s sewage treatment plants with grant money, allowing New Haven to acquire assets it could not sustain without further assistance. The costs of managing an increasingly complex system began to burden the city, and, in 2005, New Haven sold its sewerage to a regional authority for because the city felt its financial prospects would be improved without the plant. Therefore, the first point is, descriptively, cost minimization has been as or more important to the many vocal members of the local public and city politicians than meeting the environmental health, public health, or the aesthetic goals of sewage treatment.

Second, local politics creates the peculiarities and drawbacks of local control over sewage treatment, including a lack of consideration for the negative spillovers to other communities. The political benefits derived from the sewage treatment system (whether as a mayor taking a stand against the suburbs, alders trying to draw resources to their

specific wards, or the city government trying to coerce an annex to join the city) thwart the technical and environmental goals of the system, increase costs, and interfere with engineering plans. Thus, the second theme is that because of these problems, New Haven’s government needed higher levels of government to provide the incentives, and will require higher level government incentives in the future, to effectively improve sewage treatment facilities. The final theme is that regional authority control appears to provide a better baseline level of governmental control than does control by the city of New Haven.

Theory

The environmental federalism debate has spurred significant discussion about the correct level of government at which to provide environmental regulation – whether federal or at a decentralized level of control. Decentralized control offers regulation close to the environmental harm which allows sensitivity to local circumstances, and because of this local variation, provides room for government experimentation that facilitates state (or local\footnote{12} ) competition.\footnote{13} In addition, proponents of specifically local government regulation stress its role in increasing democratic participation.\footnote{14}

At the other end, federal environmental regulation prevents races to the bottom in regulation in which jurisdictions provide lax environmental regulation in order to attract

\footnote{12} Charles M. Tiebout, A Pure Theory of Local Expenditures, 64 J. POL. ECON. 416 (1956).


business,\textsuperscript{15} addresses inter-jurisdictional spillovers that cause negative externalities, prevents the problems of a tragedy of the commons,\textsuperscript{16} provides economies of scale in standard setting,\textsuperscript{17} and establishes a baseline of protection.\textsuperscript{18} In addition, environmental regulation is particularly susceptible to public choice failures, and there is some suggestion that environmental interests have more traction at the federal level by giving representation to diffuse interests or the public,\textsuperscript{19} or more cynically, to concentrated environmental special interests.\textsuperscript{20} These articles point to a consensus that where spillovers are small, state or even local control is warranted, but with nation-wide programs, a set of regulations that include federal control provides the best solution.

Similarly, discussions of the proper role of local government often suggest that a step up in government regulation from the local level is beneficial. Regional coordination of metropolitan decisions fixes many of the same problems noted by the environmental federalism scholars including negative spillovers and inequities in the baseline provision of municipal services and schools among the various towns.\textsuperscript{21} In addition to addressing


\textsuperscript{16} See Stewart, supra note 13, at 1211, 1214 (citing Garrett Hardin, The Tragedy of the Commons, 162 SCIENCE 1243 (1968) for the general tragedy of the commons proposition and explaining that there are commons problems in local and state funding for environmental protection.

\textsuperscript{17} Daniel C. Esty, Revitalizing Environmental Federalism, 75 MICH. L. REV. 570, 615-617 (1996).

\textsuperscript{18} See, e.g., Weiland, supra note 14, at 239-44.


\textsuperscript{20} However, at least during the 1970s, there was a feeling that the American people as a whole demanded greater environmental protection, and thus the initial federal environmental statutes of the 1970s were public interest statutes. While municipalities certainly pushed for large amounts of funds, see infra Part VI, it is not clear from a reading of the legislative history or a review of articles about the clean water act that construction companies were a very visible part of the coalition.

problems with spillovers and inequity, regional solutions may also foster a sense of community, true to the ideal of local autonomy, that transcends the influences of economic and social stratification between suburbs and central cities and reduces the effect of social stereotypes on local decision-making.\textsuperscript{22} There appears to be some consensus with local government scholars that regionalism is a suggested move for many regional issues such as sprawl,\textsuperscript{23} affordable housing,\textsuperscript{24} and even planning for sewage treatment.\textsuperscript{25}

There are several common approaches to regional coordination. In the literature, regional coordination does not necessarily mean regional government. First, there are few true general purpose regional governments.\textsuperscript{26} Thus, scholars suggest forming coalitions powerful enough to advance a regional agenda and focus on specific issue areas as stepping stones to more regional cooperation, and perhaps towards general purpose governments. Some have proposed regional legislatures to provide a forum for

\begin{itemize}
  \item Sherryl D. Cashin, \textit{Localism, Self-Interest, and the Tyranny of the Favored Quarter: Addressing the Barriers to New Regionalism}, 88 GEO. L. J. 1985 (2000) (questioning the benefits of strict local autonomy when the result of a fragmented metropolitan area creates stratification that encourages decisions with negative externalities).
  \item See, e.g., \textsc{David Rusk, Cities Without Suburbs} 122-24 (1993).
  \item \textsc{Gerald E. Frug, Richard T. Ford & David J. Barron, Local Government Law} 494-5 (3d Ed. 2001) (Portland, Indianapolis-Marion County, Miami-Dade County, and Minneapolis-St. Paul are the few examples of areas with something approaching a true regional government). Connecticut does not seem sympathetic to regionalism in general. For example, it abolished the county government in 1959. Terry J. Tondro, \textit{Fragments of Regionalism: State and Regional Planning in Connecticut at Century’s End}, 73 ST. JOHN’S L. REV. 1123, 1125, 1135-52 (1999) (discussing several limited attempts to equitably distribute resources within metropolitan areas such as Connecticut’s Affordable Housing Appeals Procedure that was significantly curtailed by subsequent court rulings, and failed bills for Regional Asset Districts to support cultural and other metropolitan services); Robert D. Carroll, \textit{Connecticut Retrenches: A Proposal To Save the Affordable Housing Appeals Procedure}, 110 YALE L.J. 1247 (2001).
\end{itemize}
inter-city dialogue to develop solutions to common regional problems such as transportation.\textsuperscript{27} Others suggest a big tent coalition of individuals to develop solutions to metropolitan land use issues.\textsuperscript{28}

Second, state-authorized special purpose governments to provide infrastructure improvements are a common way to bring cities and suburbs together and have been much more successful than any attempts to address more fundamental issues of inequities like public housing or education.\textsuperscript{29} These governments (known in some states as special districts, but in Connecticut as authorities) have drawbacks because they suffer from a democratic deficit. The heads of most regional governments are appointed rather than elected, citizens often do not know to which districts they belong, and the technical nature of the decisions of these districts means that few voters turn out, if elections are even held.\textsuperscript{30}

Third, inter-local agreements are another approach to regional decision-making that does not require the creation of another layer of government. While interlocal contracts easier to effectuate than regional government, municipalities still face large contracting costs that prevent some regional cooperation.\textsuperscript{31} However, inter-local contracts are not likely to encourage the participants to look out for each others’

\textsuperscript{27} Gerald E. Frug, Beyond Regional Government, 115 Harv. L. Rev. 1763, 1794-1809, 1812-17 (2002).
\textsuperscript{28} Note, supra note 23 (suggesting that the experience of the Envision Utah program which brought a widely diverse group of people together to generate an agenda to address sprawl provides a new, promising model for a coalition to encourage regional solutions).
\textsuperscript{31} Clayton P. Gillette, Regionalization and Interlocal Bargains, 76 N.Y. U. L. Rev. 190 (2001) (explaining that negotiation costs, monitoring costs may account for the fact that in many situations that would seem to benefit from formal regional coordination, little exists, and thus voluntary coordination provides a good intermediate step).
interests, nor are they likely to ripen into full scale regional governments that address substantial issues of equity.\footnote{Laurie Reynolds, \textit{Intergovernmental Cooperation, Metropolitan Equity, and the New Regionalism}, 78 WASH. L. REV. 93, 130-32 (2003).}

New Haven’s story provides support for some of the benefits of local level regulation. The federal and state sewage treatment regulatory programs left planning and design of plants to the local level and contractors hired by the local government and in consultation with local engineers designed New Haven’s sewage treatment plants to accommodate local population needs and to defer to other New Haven goals, such as business redevelopment, arguably a good move for the city. However, as a long-time engineer noted, outside instigation was necessary to improve the environmental impacts of sewerage.\footnote{Frug, \textit{supra} note 27, at 1784, 1787 (arguing that special purpose governments make general purpose regional government less likely by providing regional solutions only for those government services that benefit certain communities, thereby “reliev[ing] the pressure” for general purpose regional governments that address more important metropolitan equity issues), Reynolds, \textit{supra} note 32, at 137-49 (making the same point but explaining that those that benefit from special purpose governments are usually suburbs). \textit{But see} Esty, \textit{supra} note 17, at 645-46 (explaining, using the example of the European Union, that the sense of community created by economic agreements can ripen into more substantial regional cooperation).} The city was conservative and did not want to spend money on sewerage until it was forced to.\footnote{Interview with Henry Goetz, Professional Engineer, New Haven City Engineer’s Office (1952-1993), New Haven WPCA (1993-2005), Greater New Haven WPCA (GNHWPCA), in New Haven, Conn. (Dec. 14, 2005).} In addition, as explained above, because costs and funding drove the pace of the system, the more layers of government involved, usually, the more money, and thus the better the institutional structure for the city of New Haven. Thus, New Haven’s sewerage story provides a case study for the benefits of state and federal environmental regulation.

In addition, the recommendation of regional solutions by local government scholars resonates with New Haven’s sewage treatment system. A regional approach to

\footnote{Id.}
planning, design and management of a sewage treatment plant in New Haven makes sense for both environmental protection reasons and harmony among localities. First, ecologically, the region that affects the condition of the New Haven Harbor includes towns outside the New Haven city limits (see the map of the Harbor and surrounding towns, figure 1), and these communities must participate to ensure an effective solution to the pollution of the Harbor. Decentralized decisions about sewage treatment plants encourage engineers and consultants to design “postage-stamp plants” that do not consider the effects on surrounding towns, the water quality of the waters receiving the effluent, or land use decisions. Second, intergovernmental contracts with the surrounding suburbs have always been acrimonious, demonstrating the drawbacks to these agreements. One of the hopes for those involved in the regionalization of New Haven’s sewage treatment system is that the new institutional structure will minimize the importance of cost considerations and political wrangling to the direction of the next stages of sewage treatment in New Haven – demonstrating that a politically isolated special district government can have many benefits in the context of infrastructure development. Third, the democratic deficit problem of regional solution is less troubling in the case of sewerage. In New Haven, public involvement in decisions about sewerage

36 Interview with Lynne Bonnett, President, Environmental Justice Network, in New Haven, Conn. (Nov. 13, 2005) (noting that one of the benefits of a regional authority is better water management for the Long Island Sound because a regional authority provides a coordinated approach).
37 See Daniel B. Rodriguez, The Role of Legal Innovation in Ecosystem Management: Perspectives from American Local Government Law, 24 ECOLOGY L.Q. 745, 757-58 (1997) (suggesting that an ecosystem wide regional government provides for better coordination of decisions beneficial to the ecosystem, creates more opportunities for beneficial logrolling on a wider range of issues and has more scientific expertise than local governments); Interview with Henry Goetz, supra note 34.
38 Interview with Robert Borus, Professional Engineer, Retired Engineer for the City of New Haven, in New Haven, Conn. (Nov. 16, 2005); See infra Part VII.C.
39 Interview with Frank Altiere, Acting Budget Director, City of New Haven, in New Haven, Conn. (Dec. 19, 2005) (explaining that the regional authority will allow the staff and the directors to look out for the good of the system, allowing them “damn the politics”); Interview with Members of the GNHWPCA, in New Haven, Conn. (Dec. 14 & 16, 2005).
generally involved only the question of whether the public was willing to pay higher user charges to support already constructed infrastructure (to which the public usually answered no, loudly). Sewerage is technical infrastructure, and, within New Haven, the public has not been involved in any decision that significantly affected equitable distribution of resources – issues that are inherent in issues like education, public housing, and zoning that pose a good opportunity for the kind of deliberation that creates community identification.\(^{40}\) Instead, sewage treatment seems to provide a forum for loud arguments over funding and some interlocal grandstanding.\(^{41}\) Lastly, though not addressed in this paper, sewers and sewage treatment plants influence the growth path of growth of suburbs and cities and can create negative spillover effects on regional growth plans – thus a regional integration of not only sewage treatment but of planning can have a salutary effect on land use decisions.\(^{42}\)

II. An overview of the development of sewerage in New Haven

A. Rationale for the system

New Haven constructed its sewage treatment system to serve practical ends and to safeguard human health. The rise of the germ theory of disease in the late 1800s focused sewage treatment developments on disinfection to remove bacteria rather than diluting the sewage stream to deodorize it.

\(^{40}\) See, e.g., Richard Briffault, supra note 21, at 452-54. (arguing that the local ideal of small towns engendering vibrant local dialogue that creates a sense of community obfuscates the true nature of localism which allows municipalities to only look out for local self-interest without considering the surrounding towns and to reinforce class and racial separation of communities).

\(^{41}\) See infra Parts V.B, VII.

\(^{42}\) Note, supra note 25, at 749-50 (discussing the lost opportunity for effective land use planning using Clean Water Act sewage treatment grants and proposing that the EPA give sewage treatment plant funds to regional planning organizations rather than municipalities to encourage better land use planning).
Beyond health, recreation was an important part of New Haven sewerage’s interaction with the Harbor. The putrescent condition of the Harbor throughout most of the twentieth century did not stop many hardy citizens from bathing in its waters – but the New Haven Board of Health issued repeated calls to ameliorate its condition. In addition, sewage treatment addressed aesthetic environmental health issues in New Haven beyond noxious gases and miasmas. Environmental movements throughout the twentieth century encouraged a national discussion about the intrinsic value of natural resources.

The Harbor has long been a source of economic development, and the sewer system has both aided and frustrated this development. The industries of New Haven have used Harbor to accept the waste products of their production processes. Also, the rivers feeding into the Harbor and the Harbor itself provided grounds to produce oysters for commercial sale, an interest which New Haven attempted but often failed to protect.\(^{43}\) Third, the Harbor feeds into the Long Island Sound which supports commercial fishing. The Sound was threatened by pollution from sewage treatment plants, especially those near New York City in the later part of the century.

The values: health, recreation, economic development, and natural resources’ intrinsic value provided much of the motivation for New Haven’s sewage treatment system.\(^{44}\)

However, beyond promoting these values, the city also had to manage its costs. In the initial days of sewage treatment plant construction, sanitary engineers hoped that the

\(^{43}\) NEW HAVEN CHARTER, APP., NEW HAVEN GEN. STAT. §§ 3093, 2701 (APP. §§ 18, 20) (Rev. 1918) (prohibiting the dumping of substances in New Haven Harbor except for oyster shells enforced by fines and imprisonment of less than 6 months).

\(^{44}\) These values are certainly not the brainchild of the twentieth century. For example, a Connecticut state report explained that the “present evils of the system of water carriage” included: danger to health, economic consequences such as the killing of commercial fish and decreasing real estate values, and the “sentimental objection” or valuing open, clean water as a “rest to the eye and the spirit – serving much the same purpose as a public park or forest reservation.” SEWAGE DISPOSAL IN CONNECTICUT: REPORT OF THE SEWAGE COMMISSION TO THE GENERAL ASSEMBLY OF THE STATE OF CONNECTICUT 1, 41, 43 (1899).
sludge that was a byproduct of sewage treatment would be useful as fertilizer sufficiently valuable to pay for the operation of the system. This wish failed to materialize in New Haven both because of the lack of nearby farmland and because of the industrial character of New Haven’s sewage. Thus, the city has long been concerned with the cost of managing the system.

B. The State of the Harbor

Beginning before the twentieth century, New Haven’s Harbor was grossly polluted with floatables, noisome gases, dyes and ringed with sludge covered mud flats. Surveys conducted in the mid-1910s estimated that New Haven’s main sewers discharged between 25 and 30 million gallons of raw sewage per day into the Harbor.\(^{45}\) Though the condition fluctuated throughout the century, the Harbor was clearly polluted and unsuited for swimming well into the final decades of the twentieth century. In each decade, local, state, and federal oversight bodies objected to the state of the Harbor both because the Harbor was viscerally displeasing and because New Haven’s sewage treatment plant’s effluent fell short of evolving standards.

In 1908, New Haven banned the “floating or fattening” of oysters in the polluted waters of Harbor.\(^{46}\) Passersby could smell “foul odors due to the decomposition of the sewage sludge that settles... about the outfalls... a considerable distance from the shore.”\(^{47}\) In 1915, the State Board of Health reported that private oyster beds had been


\(^{46}\) New Haven Board of Health, Minutes of the Meetings 363 (1898-1914). Board of Health Regulations: Regulation de Oysters § 1, in New Haven Conn., Ordinances § 431 (1914). Board of Health regulations have the same force as regular New Haven ordinances.

abandoned and major fish life had “practically disappeared” around New Haven.\textsuperscript{48} In 1916, the Federal Public Health Service warned against eating oysters from the Harbor because it was “grossly polluted by sewage discharged from the sewer outfalls,” and the “conditions [were] becoming intensified” such that “before long [will] become intolerable.”\textsuperscript{49} That fall, New Haven awarded a contract to a Providence company to dredge a basin at one of the outfalls\textsuperscript{50} from New Haven’s sewers to “abate the disagreeable features that have existed in that vicinity from the settling back of sewerage onto the mud flats around the shore.”\textsuperscript{51}

In 1926, when the Board of Aldermen decided to begin New Haven’s first sewage treatment project, a report presenting sewage treatment options for the Harbor called the current situation “insanitary.”\textsuperscript{52} More graphically, “the discharge of thousands of tons of settleable sewage solids each year has formed accumulations of putrescible matter on the bed of the harbor and its branches, ranging in depth from a few inches to over ten feet.”\textsuperscript{53} The decomposition of these solids “interferes with fish life, and causes objectionable odors discernible at considerable distances from the water front.”\textsuperscript{54} Finally, the Harbor was discolored due to dye works wastes, covered by an “oil sleek” and littered with

\textsuperscript{48} CONNECTICUT STATE BOARD OF HEALTH, REPORT ON THE INVESTIGATION OF THE POLLUTION OF STREAMS 105 (1915).
\textsuperscript{49} Edward S. Nettleton, Report Commissioned by Board of Aldermen on Sewage Disposal, in 1925 J. BOARD OF ALDERMEN OF NEW HAVEN PAGE 279-92 (Sept. 14, 1925).
\textsuperscript{50} An outfall is the point where a sewer or a sewage treatment plant discharges into the receiving waters, in this case, the Harbor.
\textsuperscript{52} FULLER & MCCLINTOCK, REPORT ON THE COLLECTION AND TREATMENT OF THE SEWAGE OF THE CITY OF NEW HAVEN, CONN. 3 (Dec. 1, 1926).
\textsuperscript{53} Id. at 3-4.
\textsuperscript{54} Id. at 4.
"floating solids."\textsuperscript{55} The committee explained that these conditions are "prejudicial to the continued development of the city."\textsuperscript{56}

In 1971, primary treatment\textsuperscript{57} sewage plants had not considerably improved the condition of the Harbor. Local residents reported that the "odor alone drives people away." The Water Resources Section of the State Department of Environmental Protection (DEP) had been "after both the city and [local] companies for some time now," to clean up the Harbor.\textsuperscript{58} Continuing through the 1980s, New Haven residents recall that people avoided the Harbor because its smell repelled potential visitors from blocks away.\textsuperscript{59}

Today, however, New Haven's Harbor is an active industrial port, supporting recreational and business interests.\textsuperscript{60} While it is bordered by a major U.S. highway and serves as an oil port, perhaps diminishing its aesthetic value to some, the Harbor offers clear views to Long Island Sound over a Harbor without oil slicks or obvious floating matter, provides recreation at Nathan Hale Park and Lighthouse Point, and shore side restaurants like the Rusty Scupper offer scenic views of the Harbor and the Sound. It has an inoffensive smell and the rivers flowing into it support oystering. Technological advances in New Haven's sewage treatment are largely responsible for this change.

\textbf{C. Construction of the system}

\textsuperscript{55} Id.
\textsuperscript{56} Id.
\textsuperscript{57} For discussion of the three levels of sewage treatment, see infra Part III.C.
\textsuperscript{59} Interview with Donna Hall, City Planner, New Haven City Plan Department, in New Haven, Conn. (Mar. 2005).
Connecticut Colony had a commissioner of sewers as far back as the early 1700s to clean and repair drains and ditches.\textsuperscript{61} From New Haven's founding through the mid-1800s, New Haven residents accumulated waste material, and town government workers carted it out of the city to prevent nuisances on the streets and stop the spread of disease.\textsuperscript{62} Rainwater and other runoff drained into a system of cisterns that firefighters used to save homes.\textsuperscript{63}

Then, in the 1860s, New Haven began work on a comprehensive system of pipe sewers. In 1862, New Haven received a comprehensive drinking water system managed by the privately owned New Haven Water Company. The year prior, to address the increased amounts of water that would flow out of homes and businesses, New Haven began building sewers to prevent the new water supply from flooding the streets.\textsuperscript{64} The city proceeded to add sewers throughout the decade, and the system gained coherence when, in 1871, E.S. Chesbrough, the father of the Chicago sewer system, created a master plan for New Haven.\textsuperscript{65} The plan consisted of five sewerage districts leading to separate outfalls in the Harbor (see figures 2, 3 & 4). Each district had a large main with lateral branches, all constructed from brick and vitrified stone; a well designed system that would support a much larger city than New Haven.\textsuperscript{66} The New Haven built a combined sewer system. Some cities have two sets of pipes -- one for stormwater runoff and one for sanitary waste from homes and businesses. In a separated system, the former passes

\textsuperscript{61} Cohen, \textit{supra} note 8, at 59 (citing NEW HAVEN COLONIAL RECORDS 505 (Charles J. Hoadly ed. 1728)).
\textsuperscript{62} \textit{Id.} at 128.
\textsuperscript{63} Interview with Members of the GNHWPCA, \textit{supra} note 39.
\textsuperscript{64} Davenport, \textit{supra} note 8, at 20. Other sources claim that the first sewer line was built in 1862. Cohen, \textit{supra} note 8, at 397.
\textsuperscript{65} Davenport, \textit{supra} note 8, at 21-22.
\textsuperscript{66} \textit{Id.} at 24.
through storm sewers and the latter through sanitary sewers. In New Haven’s sewer system, waste and runoff were intermingled in one set of pipes.

The sewer system was a public and private enterprise in both planning and financing. The system began at the Nine Squares and spread outward to the surrounding neighborhoods, built primarily by private contractors. While the city had a comprehensive plan for development, citizens could petition for construction of lateral sewers connected to the mains. The city financed the sewer system through general tax revenues, special assessments, and user fees; in addition, the public had to construct its own house drains leading to the sewers. As the sewer system expanded, New Haven passed bylaws requiring citizens to dispose of the refuse collected in privies into a public sewer, into tidal waters, or into protected vaults, and by 1914, privies were largely eradicated on sewered streets.

New Haven’s sewers system still consists of five main sewering districts, but the outfalls are now routed through pumping stations to the only sewage treatment plant in New Haven, the East Shore Plant, which provides tertiary treatment for New Haven, Hamden, Woodbridge, and East Haven’s sewage.

The sewage pouring from the outfalls of New Haven’s sewer system caused a significant portion of the Harbor’s objectionable pollution. New Haven’s sewers removed potential hazards from households concentrated them and poured them, untreated, into the Harbor, where engineers and policymakers initially thought that, with

---

67 Id. at 28.
68 Id. at 32.
69 Id. at 34-36.
70 Cohen, supra note 8, at 166 (citing Tuttle et al., Rules, Regulations and By-Laws of the Board of Health of the City of New Haven 14 (1874)). Id. at 277. See figure 12 for a chart showing the growth of sewers in New Haven.
sufficiently long pipes from the sewer outfalls, the tidal action of the Harbor would effectively dilute and sterilize the waste and bring it out to Long Island Sound. 71 By the 1910s and 1920s, the Harbor was clearly polluted, and specifically polluted by sewage sludge.

By the 1950s, New Haven had constructed three primary sewage treatment plants to treat the effluent from the five sewerage districts. New Haven officially opened its first sewage treatment plant at East Street, in 1931, 72 the second in 1938, the Boulevard Plant, 73 and in 1953, it completed the third of it sewage treatment plants, the East Shore plant in the 32nd ward on the eastern shore of the Harbor. 74 In the 1980s, New Haven upgraded the East Shore Plant to provide secondary sewage treatment and remodeled the Boulevard and East Street plants into pumping stations that conveyed sewage to the renovated East Shore Plant. Thereafter, all sewage in New Haven was treated with secondary sewage treatment to comply with the federal mandates of the Clean Water Act.

III. Sewage treatment technology

A. Wastewater characterization

To explain the various methods of sewage treatment technology, it is helpful to have some understanding of sewage. Sewage is composed of solids and water, with a varying percentage of the solids contributed by household waste (human wastes, food

---

71 WINSLOW & MOHLMAN, supra note 45, at 96.
72 See map of New Haven's sewer system and the major outfalls of the system, figures 2-4. The East Street site, near the northernmost part of the Harbor, is now a pump station that pumps sewage to the East Shore plant near the Sports Haven and the Rusty Scupper restaurant.
73 Near the southwestern entrance to the inner Harbor (see figure 4).
74 This plant is located along East Shore Parkway near oil tanks of New Haven's Port (see figure 4).
wastes\textsuperscript{75}) and industrial wastes, which are now subject to national pretreatment standards under the Federal Clean Water Act (CWA).\textsuperscript{76} Sewage is characterized by the level of biochemical oxygen demand (BOD) which measures the amount of dissolved oxygen used by micro-organisms to oxidize or stabilize organic matter.\textsuperscript{77} BOD is important because micro-organisms will naturally oxidize sewage, and sewage with a high BOD will deplete the oxygen in a water body and asphyxiate fish and plant life.\textsuperscript{78} Wastewater is also characterized by the level of bacterial contamination, generally measured as the amount of coliform bacteria present.\textsuperscript{79} Coliform counts are a measure of human pollution remaining after sewage treatment.\textsuperscript{80} They also serve as a good proxy for the presence of other bacterial pathogens because a treatment system that successfully removes most of the coliform bacteria generally removes most of the other harmful parts of sewage.\textsuperscript{81} Sewage also contains pathogens, or viruses, and nutrients, such as nitrates and phosphates present in fertilizer.\textsuperscript{82} Heavy metals, antibiotics, and toxic chemicals comprise small parts of the general sewage stream.

B. Sewage treatment technology

\textsuperscript{75} The garbage disposal increased the amount of food wastes entering sewers. The garbage disposal was installed in homes primarily after World War II, and became widespread in 1960 after a long debate among sanitary engineers who were worried that garbage disposals might dramatically increase sludge in sewage treatment plants and public health officials and municipal employees who thought that garbage disposals could reduce municipal waste. See generally Suellen Hoy, The Garbage Disposal, the Public Health, and the Good Life, 26 TECHNOLOGY AND CULTURE 758 (1985).

\textsuperscript{76} The Clean Water Act set national pretreatment standards preventing the introduction of certain pollutants into publicly owned treatment works (POTW) and required many entities to apply for National Pollutant Discharge Elimination System Users (NPDES) permits. See Clean Water Act, 33 U.S.C. § 1342 (2001).

\textsuperscript{77} METCALF & EDDY, INC., WASTEWATER ENGINEERING: TREATMENT, DISPOSAL AND REUSE 71 (3d. ed. 1991). Metcalf & Eddy has long been the authoritative textbook on sewage and sewage treatment (it has been termed “the Bible” of sewage treatment).

\textsuperscript{78} Id. at 71.

\textsuperscript{79} Id. at 91.

\textsuperscript{80} Id.

\textsuperscript{81} Interview with Jordan Peccia, Assistant Professor of Environmental and Chemical Engineering, Yale University, in New Haven, Conn. (Oct. 19, 2005).

\textsuperscript{82} METCALF & EDDY, INC. supra note 77, at 85-86, 93.
Cities use two methods to eliminate the pollution from untreated sanitary waste discharge: sewage treatment plants and the separation of combined sewer systems. Many older cities, like New Haven, have at least partly combined sewer systems because a combined system is cheaper to build and when these systems were built, engineers believed that the receiving waters could purify the waste.\textsuperscript{83} Combined systems like New Haven’s cause problems during major storms. Sewage treatment plants are typically built a small, 3 to 5, multiple of the dry weather requirements of the system.\textsuperscript{84} During storms, the rainwater flowing into the sewer system from catch basins on street corners overwhelms the capacity of most sewage treatment plants and the extra flow passes, untreated, into the receiving waters.\textsuperscript{85} However, once the sewers are separated, the stormwater sewers empty directly into the Harbor and the sanitary waste alone is treated.

Modern sewage treatment nationally and in New Haven involves several stages: primary, secondary and nutrient removal.\textsuperscript{86} Each process is characterized by different technologies that target a different aspect of wastewater. Settliable solids, or those that settle to the bottom of a cone in an hour period, are a good indicator of the amount of sludge that will be produced in treating the wastewater.\textsuperscript{87} Solids in wastewater can also be divided by their filterability: solids are either filterable or nonfilterable (suspended


\textsuperscript{84} Interview with members of the GNHWPCA, \textit{supra} note 39.

\textsuperscript{85} New Haven’s East Shore Plant has a 47 million gallon/d capacity (mgd). During a two-year rain event, or the heaviest storm expected in any two year period, the system can take in 104 mg of rainwater, thereby significantly overwhelming the system. \textit{See CH2MILL, FINAL REPORT CITY OF NEW HAVEN LONG-TERM COMBINED SEWER OVERFLOW CONTROL PLAN I-2} (Apr. 2001).

\textsuperscript{86} Depending on the process used for nutrient removal (whether it involves a separate tank system beyond those used for secondary treatment), engineers refer to this stage as tertiary or advanced treatment. Some nutrient removal is accomplished using secondary treatment.

\textsuperscript{87} METCALF & EDDY, INC., \textit{supra} note 77, at 50.
solids).\textsuperscript{88} The filterable solids can be divided into dissolved and colloidal solids, the latter of which cannot settle without biological or chemical processes to provide coagulation and precipitation.\textsuperscript{89}

Primary treatment involves the removal of suspended solids and organic matter through screening and sedimentation.\textsuperscript{90} Secondary treatment, which is defined by EPA regulations authorized by the Clean Water Act,\textsuperscript{91} involves the removal of biodegradable organics and suspended solids by activated sludge or lagoon systems with sedimentation.\textsuperscript{92} The current regulations, in place since 1984, require a 30-day average BOD and suspended solids removal of not less than 85 percent, and the pH (a measure of the acidity of the effluent) must remain between 6.0 and 9.0 (pure water is 7.0).\textsuperscript{93} To achieve tertiary treatment, or nutrient removal, engineers can modify secondary sewage treatment tanks or add another step to the process to remove nitrogen and phosphorous.\textsuperscript{94}

\textbf{C. Evolution of sewage treatment technology}

Early sewage “treatment” consisted of the dilution method. Partially because it was cheap and easy, the dilution method, or allowing the natural processes of the receiving water body to clarify and decontaminate sewage (schoolchildren learned the maxim “the solution to pollution is dilution”)\textsuperscript{95} was widely practiced first alone and then

\begin{itemize}
\item \textsuperscript{88} Id.
\item \textsuperscript{89} Id. at 51-52.
\item \textsuperscript{90} Id. at 50.
\item \textsuperscript{91} 40 C.F.R. § 133.102 (as promulgated in 1984, 49 Fed. Reg. 37006 (Sept. 20, 1984)).
\item \textsuperscript{92} METCALF & EDDY, INC., supra note 77, at 128. Secondary treatment is also defined in the Clean Water Act to set standards for BOD, the quantity of suspended solids, acidity, and carbonaceous BOD, but the standards vary if the sewage treatment plants receive sewage from combined sewers.
\item \textsuperscript{93} 40 C.F.R. § 133.102.
\item \textsuperscript{94} METCALF & EDDY, INC., supra note 77, at 128.
\item \textsuperscript{95} Interview with Larry Smith, Professional Engineer, City of New Haven Engineering Department, in New Haven, Conn. (Oct. 4, 2005).
\end{itemize}
in combination with primary treatment in the early part of the century. To effectively
dilute sewage, engineers had to provide sufficiently long outfalls to prevent sludge from
building up along shore lines and to allow sufficient mixing with the receiving water.\(^{96}\)
Many municipalities used primary treatment methods such as filtration and sedimentation
methods – or holding sewage in tanks to allow the solids to precipitate out.\(^{97}\)

In the 1910s, more advanced techniques included septic treatment, chemical
precipitation that used chemicals to precipitate out suspended material, and sterilization
through fine grained filtration using sand or gravel\(^{98}\) or chlorination.\(^{99}\) Mechanization
reduced the labor intensity of many of the operations, but the basic technology remained
the same.\(^{100}\)

Many Eastern cities continued to use only primary sewage treatment through the
late 1970s and into the 1980s because of political delays and not because of insufficient
scientific breakthroughs: scientists and many policymakers understood the technology
necessary to remedy the problems of water pollution from sewage treatment throughout
the twentieth century. For example, primary sewage treatment was well understood and
hundreds of cities had adopted primary treatment by 1910, many using some form of
septic treatment with anaerobic biological (using bacteria) processes to gasify and liquefy
the sludge, thereby reducing its volume.\(^{101}\) New Haven, however, did not open its first
primary treatment plant, the East Street Plant, until 1931. Ward Island, Manhattan’s

\(^{96}\) See George W. Fuller, Sewage Disposal 318-77 (1912).
\(^{97}\) See generally, id.
\(^{98}\) Id. at 374-76.
\(^{99}\) Id. at 374 (explaining that chlorination replaced filtration because it more effectively neutralized the
health hazards of bathing near sewage outfalls).
\(^{100}\) Id. at 385. For example, screens were hand cleaned frequently to prevent clogging. However,
mechanization had begun by 1912 – Washington, D.C., had a system at its sewage treatment works to
hydraulically lift the screens from the screening area to allow easier cleaning. Id.
\(^{101}\) Fuller, supra note 96, at 395-96.
sewage treatment plant, employed activated sludge, a common form of secondary treatment used today, when it opened in 1937. New Haven did not treat its sewage using activated sludge secondary treatment methods until the mid-1980s.

The technology of sewage treatment changed slowly in the Eastern part of the country throughout the twentieth century partly because chlorination of primary treated sewage very effectively reduced bacterial contamination (except during infrequent storms) the cause of the immediate health threat that spurred cities to build many sewage treatment plants during the 1910s. Cities more slowly addressed the sludge problem that remained even after primary treatment: without an immediate health threat, political inertia and the high costs of plant upgrades prevented quick action without strong incentives.

IV. Legal backdrop – local, state and federal laws, regulations, and institutions affecting New Haven’s sewerage

Federal

At the turn of the century, federal law did not reach far beyond the direct regulation of interstate commerce. The Rivers and Harbors Act of 1899 was the first national legislation to regulate water quality. It banned refuse discharges into federal waters to prevent obstacles to interstate trade. The law primarily addressed concerns with commerce and not with health or environmental concerns, and therefore, the Act did

---

102 ANDERSON, supra note 9, at 129-45.
103 Interview with Professor Jordan Peccia, supra note 81.
not govern the discharge of liquid wastes, only the large solids that might block ships’
paths.\textsuperscript{105}

In 1914, the Federal Public Health Service, with the authority to investigate
sanitation, sewage, and the pollution of navigable waters of the United States, issued
bacteriological standards for interstate commerce after sanitary engineers discovered a
method to measure bacteria from sewage.\textsuperscript{106} In 1916, the Federal Public Health Service
warned New Haven residents about the danger to bathers and swimmers and to those who
ate shellfish from the Harbor.\textsuperscript{107}

By the middle of the century, the federal government began funding designs and
plans for states’ sewage treatment plants under the Water Quality Act of 1948.\textsuperscript{108} In
1956, under the Federal Water Pollution Control Act, Congress also began funding
construction of the plants.\textsuperscript{109} These early programs failed to produce significant results
and, therefore, to provide more accountability and uniformity to the pollution programs,
Congress required states to adopt water quality standards, under the Water Quality Act of
1965,\textsuperscript{110} and allowed the federal government to set standards for the states if they failed

\textsuperscript{105} N. William Hines, Nor Any Drop to Drink: Public Regulation of Water Quality; Part III: The Federal
Effort, 52 IOWA L. REV. 799, 803-04 (1967).
\textsuperscript{106} Joel A. Tarr, Industrial Wastes and Public Health: Some Historical Notes, Part I: 1876-1932, 75
\textsuperscript{107} WINSLOW & MOHLMAN, supra note 45, at 1-2, 6-8.
\textsuperscript{109} Pub. L. No. 84-660, 70 Stat. 498 (1956); PERCIVAL, supra note 104, at 577-78. President Eisenhower,
like Nixon to follow, opposed the grants for sewage treatment plants, but for different reasons. Eisenhower
believed that the treatment plants were properly controlled by the local government, and the federal
government should not intervene. Robert V. Percival, Environmental Federalism: Historical Roots and
to on their own. Also in 1965, federal facilities were required to provide secondary sewage treatment.\textsuperscript{111}

When the Water Quality Act of 1965 and the state laws passed in response to it proved ineffective at spurring state action,\textsuperscript{112} Congress passed the Federal Water Pollution Control Act Amendments (the Clean Water Act or CWA) in 1972,\textsuperscript{113} over President Nixon's veto. Among other goals, the federal government signaled its intention to make dramatic improvements in sewage treatment by setting a national standard for publicly owned sewage treatment plants or POTWs\textsuperscript{114} – secondary treatment by 1977 and advanced or tertiary treatment by 1983.\textsuperscript{115} It provided sanctions if a municipality failed to meet a pollution abatement deadline.\textsuperscript{116} More broadly, the Clean Water Act established a goal of fishable, swimmable waters by 1983. The Clean Water Act regulated all point sources discharging into the surface waters of the United States with a permit system requiring control technologies for each source.\textsuperscript{117}

To put muscle behind the fishable-swimmable goal for POTWs, the Congress provided federal grants including an $18 billion authorization, second only to the federal highway program as a public works project\textsuperscript{118} that funded 75 percent of the cost of


\textsuperscript{112} 118 CONG. REC. 33747, 33762-63 (statement of Rep. Don H. Clausen), \textit{reprinted in 1 ENV'T POL'Y DIVISION OF THE CONG. RES. SERVICE, A LEGISLATIVE HISTORY OF THE WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972, at 264-65 (1973) (explaining that the 25 percent matching grant required under the then existing Federal Water Pollution Control Act § 8(b) had proved too onerous for states).}

\textsuperscript{113} Federal Water Pollution Control Amendments (Clean Water Act).

\textsuperscript{114} Publicly owned treatment works.

\textsuperscript{115} 33 U.S.C. § 1311(b)(1)(B) (2001). The secondary treatment deadline was pushed back to 1988 as part of the 1981 Clean Water Act Amendments. The advanced treatment requirement was removed.


\textsuperscript{117} PERCIVAL, \textit{supra} note 104, at 579.

\textsuperscript{118} ROSENBAUM, \textit{supra} note 2, at 11.
construction of sewage treatment works. Industrial polluters were required to pre-treat their waste before discharging it into municipal sewer systems. The program also covered sewage collection systems, which was not envisioned in early versions of the bill, but the funds were eventually designated to go first to sewage treatment plants and then to collection systems – thus leaving sewer separation programs largely unfunded.

President Richard Nixon vehemently opposed the 75 percent federal share – he had proposed a bill to provide $6 billion for federal grants – because of the implications of a “budget-wrecking” $24 billion total federal spending that would increase federal taxes and put inflationary pressure on the economy. Nixon’s EPA initially supported a stronger commitment to cost sharing between the federal and lower levels of government and a lower federal share. The administrator of the EPA was concerned about the consequences for the communities after the funds ended, and therefore wanted more local control and a larger local percentage share.

---

119 Clean Water Act § 202(a).
120 Clean Water Act § 307(b).
121 Clean Water Act § 211.
125 Id. In testimony about the percentage of the federal support, the Administrator of the EPA, William Ruckelshaus explained that a strong federal commitment was necessary, but that to provide support much above half of the cost would eliminate the responsibility of the state and local partners which would be “highly undesirable.” Water Pollution Control Legislation, Amendments to Existing Legislation: Hearing on H.R. 5958, H.R. 5962, H.R. 5966, H.R. 5970, and H.R. 4732 Before the H. Comm. on Public Works, 92nd Cong. 6-7 (1971) (statement of William D. Ruckelshaus, Administrator, EPA).
126 See Water Pollution Control Legislation, Amendments to Existing Legislation: Hearing on H.R. 5958, H.R. 5962, H.R. 5966, H.R. 5970, and H.R. 4732 Before the H. Comm. on Public Works, supra note 114, at
Eventually, effective lobbying by states and municipalities convinced the EPA to support the 75 percent federal share\textsuperscript{127} to provide funding for sewage collection systems in addition to sewage treatment plants, because of the dire financial straits of municipalities.\textsuperscript{128} Since 1972, the federal government has provided $67 billion towards local construction of wastewater treatment plants.\textsuperscript{129}

These programs greatly increased the environmental infrastructure of the United States. However, the legacy remains mixed. First, an infusion of funds to construct complex sewage treatment plants ran into a key shortage—engineering and construction companies competent to design and construct these plants. As one of the engineers in New Haven’s City Hall in the 1970s explained, there were plenty of concrete and road building firms out of luck as the federal highway program ended, and they offered their


\textsuperscript{128} See, e.g., 118 CONG. REC. 10201, 10251 (1972) (statement of Wendell R. Anderson, Governor of Minnesota) (explaining that a large federal commitment is not inconsistent with the local success of a construction program, using the federal highway program as an example), 118 CONG. REC. 33747, 33762-63 (1972) (statement of Rep. Don H. Clausen) (explaining the discrepancy between the approximate appropriation suggested by the federal government, $6 billion, and that suggested by Congress, $24 billion, of which $18 billion was allocated for sewage treatment plant construction, is that Congress acknowledges that federal money is needed to fill the as-yet prohibitive gap between local needs and state funds for sewage treatment plants to reach the stringent requirements of the federal mandates). In addition, the Congressional allocation included funds for sewer collector systems—a provision absent in earlier bills that only covered sewage treatment works narrowly construed, a provision strongly supported by Rep. Robert Roe of New Jersey. 118 CONG. REC. 33747, 33764 (1972). Interestingly, Rep. Roe now receives a retainer from the sewerage commission in New Jersey to help it obtain federal and state grants, something at which he is apparently quite skilled. Ted Sherman, \textit{These Waters and Sewer Agencies Hand Out Plenty of Work and Patronage To Those with the Right Connections}, NEWARK STAR-LEDGER, July 27, 2003, available at http://www.gsenet.org/library/14njs/watrcash.php.

services to municipalities trying to build sewage treatment facilities. The success of sewage treatment construction depended on how well municipalities kept up their facilities once the funds dried up in the Clean Water Act Amendments of 1987.131

State

At the state level, Connecticut has long been involved in the regulation of water pollution. The Connecticut General Assembly passed one of the first state water pollution control laws in 1925132 that authorized the creation of a State Water Commission and provided citations for “[a]ny person, firm or corporation causing the pollution of any water.”133 The legislature defined pollution to include “contamination ... of any water by reason of any sewage ... discharged or deposited by any public or private sewer” that renders the water unclean or impure,134 words that were not defined. The law, while its text provided one of most stringent water pollution laws in the country, was rarely enforced. The Commission had the authority to enforce court orders against municipalities – however until the time of the Connecticut Clean Water Act in 1967, the Commission had issued only 31 orders against municipalities, many of which were issued against the same municipalities multiple times.135 Some of these were issued for New Haven.136

---

130 Interview with Robert Borus, supra note 38.
136 See infra Part VII.A.
In 1967, to address the deficiencies in the 1925 law, Connecticut passed the Clean Water Act of 1967, which was based on the findings of the Governor’s Clean Water Task Force. The Connecticut Act planned to contribute $150 million to the sewage treatment plant improvements and reduce the 100 million gallons of raw sewage and 100 million gallons of industrial effluent discharged daily into Connecticut waters.\textsuperscript{137} The $150 million was to provide 30 percent of the cost of municipal facilities with an expected 50 percent contribution from the federal government. In the event the federal government delayed its contribution, state funds were provided to begin the project and later reimbursed with federal grant money.\textsuperscript{138} The goal of the act was to ensure that Connecticut had “clean water” by 1974.\textsuperscript{139} In 1967, the State Water Resources Commission ordered New Haven to abate pollution of State waters from its sewage treatment plants by 1972.\textsuperscript{140} Under the 1967 state act, the Commission was able to issue fines for violations of the act,\textsuperscript{141} however, the act also allowed numerous appeals, first from the Commission order to abate pollution and then, if the municipality did not comply with the order, the Commission had to request that the attorney general bring a separate action in Connecticut state court to enjoin the pollution.\textsuperscript{142} Not surprisingly, the act was ineffective at spurring significant New Haven action before Congress intervened with the federal Clean Water Act.

\textit{Local}

\textsuperscript{138} CONN. GEN. STAT. § 25-54 (r)) (1977) (current version at CONN. GEN. STAT., § 22a-439).
\textsuperscript{139} 1967 H. PROC. CONN. GEN. ASSEMBLY \textit{supra} note 137, at 912.
\textsuperscript{140} QUIRK, LAWLER & MATUSKY ENGINEERS, STATE OF CONNECTICUT WATER RESOURCES COMMISSION, NEW HAVEN HARBOR EFFECT OF INCREASED WASTE TREATMENT AND OUTFALL LOCATION ON WATER QUALITY I (July 1969).
Locally, beginning in 1912, the New Haven Board of Health called for sewage treatment beyond that provided by the tidal flushing of the Harbor to protect the shellfish industry, to create an aesthetically pleasant Harbor, to improve the city’s sanitation, and because the city had traced several cases of typhoid fever to sewage-contaminated oysters from the Harbor.\(^{143}\) The Board of Health frequently urged New Haven to address its pollution problems, but to little avail.\(^{144}\)

V.  Local control

A.  The East Street Plant

The story of the construction of New Haven’s first sewage disposal plant demonstrates the failures of the cooperative federalism model in the early part of the century and the slow pace of planning and construction under local leadership. While the World War I-era warnings from the federal Public Health Service instigated some action on the part of Mayor Lee, plans for a sewage treatment facility had no momentum until 1926 when the Board of Aldermen. The tireless efforts of Professor Winslow of the Yale School of Public Health, head of the New Haven Board of Health, and a member of the New Haven Chamber of Commerce took over fifteen years to bear fruit with a sewage treatment plant constructed at New Haven’s largest outfall.

New Haven’s first sewage treatment plant was officially opened on January 14\(^{th}\), 1931, in the early days of the Depression (see picture of the almost completed plant, figure 5 and its design, figure 6). It reduced the solids in the effluent, somewhat improving the aesthetics of the Harbor. The plant also chlorinated the effluent during the

\(^{143}\) Cohen, supra note 8, at 265-66 (citing Report of the Health Officer, in 1912 ANNUAL REPORT OF THE NEW HAVEN BOARD OF HEALTH 4 (1912)). In 1915, control of garbage disposal and other similar sanitary services passed from the Board of Health to the Public Works Department as the task grew too large for the Board of Health. Cohen, supra note 8, at 265.

\(^{144}\) See infra Part V.
bathing season to prevent bacterial contamination during summer recreation. Arguably, chlorination provided the first steps towards restoring New Haven’s oyster industry by neutralizing bacterial contamination.

By 1932, the East Street Plant was processing eight to nine million gallons of sewage a day; about a third of New Haven’s effluent at the time.\textsuperscript{145} While it was an important first step, it was insufficient to significantly reduce pollution in the Harbor. The engineers and concerned public citizens addressing the sewage treatment system wanted sewage treatment to for all of New Haven’s public outfalls. By 1931, one, albeit the largest, outfall had received treatment. It took until 1951 to complete primary treatment in New Haven. Granted, the Great Depression\textsuperscript{146} created difficult fiscal conditions for continuing the construction of large scale municipal facilities, but even during the 1920s, Professor Winslow failed to produce a faster solution because local instigation and funding of sewage treatment is slow and incremental. Contrasting the construction of the East Street plant with that of the Boulevard Plant and the tertiary upgrades to the East Shore project suggests that New Haven responded much more quickly to orders from high levels of government, coupled with copious funds.\textsuperscript{147}

\textit{New Haven specific study}

\textsuperscript{145} Annual Report of the City Engineer (1932), in NEW HAVEN CITY YEAR BOOK OF THE CITY OF NEW HAVEN 183 (1932).
\textsuperscript{146} The federal government did provide some grants for municipal programs, and New Haven’s Boulevard Plant was constructed partly with Public Works Administration money, but one can understand why the onset of the Great Depression would nonetheless slow construction of city-funded infrastructure. The PWA provided almost half the cost of New Haven’s sewage treatment upgrades during the 1930s. Report of the Public Works Department (1940), in CITY YEAR BOOK OF THE CITY OF NEW HAVEN 69 (1940).
\textsuperscript{147} See infra Part VII A, but see Part VI (discussing the federal role and the delayed construction because of fights with the federal government).
In response to the Public Health Service warnings, in 1916, Mayor Frank Rice commissioned a study of the latest technology in sewage treatment. The engineer in charge of the sewer division determined that the tidal prism should have provided sufficient dilution had the sewage mixed with all of the Harbor, but did not because the tide was insufficient to carry all of the sewage out to shore, thus the incoming tides pushed the sewage sludge back up into the upper Harbor, nearest New Haven.

A Citizens Committee on Sewage Disposal, headed by Professor Winslow was established to cooperate with the Aldermanic Committee on Sewers and Sanitation in recommending changes to the sewage disposal system of New Haven. The citizen group purchased land and constructed an experiment station using the expertise of the Sheffield Scientific School to test various current methods of sewage treatment.

The committee planned to recommend sewage treatment facilities tailored to New Haven’s effluent, rather than encourage industries to significantly reduce pollution from untreated waste into the sewer system. Thus, in the course of their study the committee concluded that it needed to conduct two separate experiments because the discharge from the East Street system was so unlike that of the other outfalls. The East Street effluent was highly acidic because it received used copper sulphate from the processes used to “pickle” brass shells at the Winchester Repeating Arms Factory.

---

146 Winslow & Mohlman, supra note 45, at 1-2, 6-8. Preliminary work began in 1916 when Mr. T. Curtis Hillhouse of the Bureau of Engineering began measuring the outflow from the six (sic) main outlet sewers and determined that the East Street sewer outlet carried half of the flow of the city. Report of the Department of Public Works (1916), in City Year Book of the City of New Haven 98-99 (1916).

149 The tidal prism is the mean volume of water exchanged between high and low tide. The “flushing” of the Harbor is the ratio between this prism and the total volume of the Harbor.

150 Fuller & McClintock, supra note 52, at 12.


152 Winslow & Mohlman, supra note 45, at 4.

153 Winslow & Mohlman, supra note 45, at 41.
This acidic effluent killed bacteria in the sewage,\textsuperscript{154} which eliminated some of the need for oxidization. The committee, however, recommended that the factory consider reducing the acid flow into the Harbor because the remaining bacteria were either highly resistant to chlorination or embedded in masses of suspended manner such that the city still needed to add as much chlorine as for regular sanitary sewage.\textsuperscript{155}

The researchers decided that it would be too costly to build one central sewage treatment system or to build a long outfall directly into the Sound, and therefore recommended that the city construct four small plants near the outfalls of the sewers, which were located in residential areas (see figure 4).\textsuperscript{156} The researchers focused their work on the sewage system flowing into the East Street because 16 million gallons of sewage flowed out of it as opposed to 3 million from the Boulevard system, the next largest of the 5 outfalls.\textsuperscript{157} The researchers discovered, through detailed measurements at their experiment station,\textsuperscript{158} that the most effective method for treatment was the Miles Acid Treatment\textsuperscript{159} that was additionally attractive because it offered the hope of cost

\textsuperscript{154} Id. at 41.
\textsuperscript{155} Id. at 49-50.
\textsuperscript{156} Id. at 19.
\textsuperscript{157} Id. at 1-2, 6-8.
\textsuperscript{158} The Committee conducted experiments using sewage it gathered using a “bucket elevator.” The bucket elevator scooped sewage from the sewer outfall using a series of buckets attached to a chain driven by a motor. Eighteen buckets continually rotated through the sewer outflow providing 167,000 gallons per day (correcting for a 20 percent volume loss due to “splashing”). Using this sewage collection, the committee tested several methods of sewage treatment, stationary screening, an Imhoff tank (which allowed sewage detention for sedimentation with a sloped bottom to allow collected solids to flow to the bottom of the tank), activated sludge which provided an aeration tank to decompose the sludge, chlorination (provided after treatment with the first three methods), and the Miles Acid Treatment Process (explained above). WINSLOW & MOHLMAN, supra note 45, at 27-34.
\textsuperscript{159} The Miles Acid Treatment process is a chemical sedimentation process where sewage is treated with acid and then held in tanks for days to allow sewage solids to precipitate out. WINSLOW & MOHLMAN, supra note 45, at 34. The Miles process successfully clarified the sewage. It removed around 60 percent of the suspended solids, 90 percent of the settleable solids, and reduced the \emph{B. coli} contamination by 98 percent with most of the samples showing less than 1,000 \emph{B. coli} per cubic centimeter (c.c.). Id. at 70.
Finally, the Miles process was well suited to the East Street effluent because it was already highly acidic. It seemed to meet all the goals of a sewage treatment system: cost-effective, odor-free, successful at reducing dissolved solids, and provided significant disinfection.

The study was completed and printed by 1919 and plans began for the sewage plant. Upon receipt of the report, the mayor urged the Board of Aldermen to appoint a committee to hold hearings to consider the report and its proposed recommendations. In response, the Board of Aldermen thanked the researchers, but did not appoint a committee.

Decision-making process

In 1921, years after the first study was commissioned, a sewage treatment system was still only in the planning phase. The Board of Alderman was silent on the proposed sewage treatment through the early 1920s. However, the Chamber of Commerce of New Haven considered the Harbor a discredit and “an economic damage” and its executive committee planned to educate the public on the issue of sewage treatment and encourage public officials to complete plans for sewage disposal. In 1921, the Chamber of Commerce’s Committee on Sanitation and Public Health, headed by Professor Winslow,
urged that the Chamber take "whatever steps are necessary" to construct a sewage treatment system in New Haven;\textsuperscript{166} The Executive Committee voted to write the Director of Public Works and ask that action be taken within two months of the meeting.\textsuperscript{167} But the next mention of sewage treatment in the Chamber of Commerce minutes is in 1925, when the Board of Finance considered options for sewage disposal.\textsuperscript{168} The Chamber of Commerce seems to have become preoccupied with both the problem of mosquito eradication and plans for an airport in New Haven.\textsuperscript{169}

In 1926, the Board of Alderman returned its attention to the matter, Charles E. Hamilton, a local oysterman,\textsuperscript{170} and others petitioned that "steps be taken to secure... the establishment of a system of sewage disposal that will properly conserve the natural shore and inland water resources of New Haven ...[and] not injure public health."\textsuperscript{171} The petition was referred for public hearing and report, and the Committee on Sewers and Sanitation urged that a study be undertaken to examine sewage disposal plants and their

\textsuperscript{166} Minutes of Executive Committee, Greater New Haven Chamber of Commerce 1-2 (Dec. 28, 1921) (on file with New Haven Colony Historical Society, MSS 34, Box 3, Folder 86); Minutes of Executive Committee, Greater New Haven Chamber of Commerce 1-2 (Mar. 26\textsuperscript{th}, 1919) (on file with New Haven Colony Historical Society, MSS 34, Box 3, Folder 101).

\textsuperscript{167} Minutes of Executive Committee, Greater New Haven Chamber of Commerce 1-2 (Dec. 28, 1921) (on file with New Haven Colony Historical Society, MSS 34, Box 3, Folder 86). Professor S. E. Barney was the Chairman of the Committee. The Chamber of Commerce had somewhat of an ecological bent -- in 1923, it expressed its approval for a bill of the State Commission on the pollution of streams and tidal waters that provided for a Commission to seek court injunctions for pollution of the waters of the state -- a bill that was passed in 1925, establishing the State Water Commission, see supra Part IV. Minutes of Executive Committee, Greater New Haven Chamber of Commerce 1 (Feb. 24, 1923) (on file with New Haven Colony Historical Society, MSS 34, Box 3, Folder 48). Minutes of Executive Committee, Greater New Haven Chamber of Commerce 1 (Aug. 13, 1923) (on file with New Haven Colony Historical Society, MSS 34, Box 3, Folder 48).

\textsuperscript{168} Minutes of Executive Committee, Greater New Haven Chamber of Commerce 1 (Jan. 19, 1925) (on file with New Haven Colony Historical Society, MSS 34, Box 3, Folder 38).

\textsuperscript{169} Minutes of Executive Committee, Greater New Haven Chamber of Commerce 1910-1933 (on file with New Haven Colony Historical Society, MSS 34, Box 3).


\textsuperscript{171} 1925 J. BOARD OF ALDERMEN OF NEW HAVEN 66 (Feb. 2, 1925).
Mayor Fitzgerald recommended that New Haven build sewage treatment because “theoretical and practical science” predicted future harmful health consequences of delay that would strain current sewage treatment capacity, even though some citizens were satisfied with the present system. 173

By September, City Engineer Nettleton reported on possible options for constructing a purification method that would render the sewage “bacteriologically harmless,” and recommended fine screening combined with sedimentation and chlorination because these methods did not produce the odors of the Imhoff settling tank or require the space of sand filtration. 174 He recommended that the city dump the sludge accumulated in the screens in the Sound. 175 In addition, further refining the 1918 study, Nettleton recommended that New Haven combine sewage from two outfalls so that New Haven only needed only three new sewage treatment plants. The plants were to be located at the James Street, Sea Street and East Street outfalls, creating plants named East Street, East Shore and the Boulevard Station, and would cost $2.7 million, including the pumping stations needed to consolidate outfalls. 176 In the anticipation that New Haven was a growing city, as indicated by the Mayor’s charge to build a system to accommodate New Haven 50 years hence, 177 and with an attempt to accommodate storm flows, 178 the plants were to be designed at twice normal dry weather flow. 179 The engineer sought

172 1925 J. BOARD OF ALDERMEN OF NEW HAVEN 122 (Apr. 6, 1925).
174 Edward S. Nettleton, City Engineer, Report to the Board of Alderman, in 1925 J. BOARD OF ALDERMEN OF NEW HAVEN 279-92 (Sept. 14, 1925).
175 Id. at 288.
176 Id. at 285-86, 291. This plan was eventually completed: the three sewage treatment plants eventually built in New Haven were at just these locations, with those names.
177 Fitzgerald, supra note 173.
178 See supra Part III.B.
179 Nettleton, supra note 174, at 288.
cooperation from industry and asked that industries along the waterfront stop discharging raw sewage into the waters.\textsuperscript{180}

Nettleton carefully justified his choice of sewage disposal method by supporting his description of each method with other cities’ experiences.\textsuperscript{181} Citing preeminent sanitary engineers, he concluded that the Harbor provided sufficient dilution if the sewage was screened and solids allowed to precipitate out in sedimentation tanks.\textsuperscript{182}

However, Mayor David Fitzgerald and the Board of Aldermen were not satisfied with the engineer’s report, and the mayor requested an appropriation of $25,000 to hire experts to study New Haven’s sewage treatment system.\textsuperscript{183}

The 1926 report on New Haven’s sewage treatment plants was prepared by the engineering firm of one of the nation’s pre-eminent sanitary engineers, Mr. George Fuller. Fuller rejected the Miles Acid Process primarily because conditions had changed considerably since the war: the price of Miles Treatment byproducts had dropped as had the significant acidic effluent from the Winchester Factory. In addition, the process was not well suited to large scale operations. Echoing the Engineer’s suggestion, Fuller recommended that for cost-effectiveness and the sake of simplicity, the city choose to collect sludge through screening and sedimentation in detention tanks, and dump the resulting sludge in the open ocean as was done in coastal British cities and in New Jersey.\textsuperscript{184}

In 1927, one of Professor Winslow’s students produced a study investigating the bacteriological pollution of the bathing waters of the beaches of New Haven Harbor. The

\textsuperscript{180} \textit{Id.} at 290.
\textsuperscript{181} \textit{Id.} at 287-89.
\textsuperscript{182} \textit{Id.} at 289.
\textsuperscript{183} 1925 J. BOARD OF ALDERMEN OF NEW HAVEN 341 (Nov. 9th, 1925).
\textsuperscript{184} FULLER & MCCINTOCK, \textit{supra} note 52, at 6-7.
essay found, based on an extensive sampling of waters from beaches surrounding the Harbor throughout the winter of 1926-27, that the beaches in the Harbor north of Lighthouse Park were heavily contaminated with *B. coli* – 1000 times above the State Sanitary Engineer’s standard for swimming pools.\(^{185}\)

Finally, in December of 1929, after the stock market crash, the city of New Haven approved $725,000 in East Street Sewage Disposal Plant Bonds that had been approved by the Board of Finance a year earlier and that would mature through 1960 at 4.5 percent interest, paying out semi-annually.\(^{186}\) The Mayor issued an emergency approval message to issue the bonds in December because he found that 1929 was a favorable year due to perceived favorable market conditions, and because the city had short-term notes coming due on the project.\(^{187}\) The project cost eventually cost $741,924.53.\(^{188}\)

*Technology*

New Haven opted for a simple sedimentation sewage treatment process at the East Street Plant and externalized its sludge by dumping it directly into the Sound.\(^{189}\) When the city officially opened the East Street plant, it required an emergency purchase of a boat to dispose the sludge.\(^{190}\) It towed the sludge out to the Long Island Sound and

\(^{185}\) Moxon, *supra* note 8, at 53.

\(^{186}\) 1929 J. BOARD OF ALDERMEN OF NEW HAVEN 409-10 (Dec. 2, 1929). The bonds were approved on the same day as those for the construction of the airport.

\(^{187}\) Id. at 409. The bonds were approved on the same day as those for the construction of the airport.


\(^{189}\) The East Street plant operated like a large garbage disposal with several filters and was designed largely on the recommendation of Fuller & McClintock’s 1926 report. The post-treatment liquid was dosed with chlorine during the bathing season to prevent the “pollution” of bathing beaches – addressing the concerns of public health (and specifically those of Professor Winslow and his protégé). Sludge was separated from the sewage stream in several stages. The plant operated by first filtering large objects with a coarse bar screen and then with a mechanically cleaned screen. Report of the Public Works Department (1943), in NEW HAVEN CITY YEAR BOOK 84 (1943).

\(^{190}\) Thomas A. Tully, Mayor of New Haven, Communication, in 1930 J. BOARD OF ALDERMEN OF NEW HAVEN 524-25 (Dec. 15, 1930).
dumped it about once every ten days for the first years of its operation,\textsuperscript{191} to a spot marked by a lighted buoy.\textsuperscript{192} The oversight for the choice of dumping ground demonstrates the levels of oversight that began to affect sewage treatment in New Haven: the sludge dump location was approved by the U.S. District Engineer, the State Shell Fish Commission, the State Department of Health, the State Water Commission, and the Supervisor of New York Harbor.\textsuperscript{193}

\textit{Epilogue}

In 1932, the city plan department turned its attention to the Boulevard Plant and noted that the work of building preparatory lines would provide employment for many men at the prevailing low wages of the Depression.\textsuperscript{194} In 1978, when a Master’s of Public Health Student measured the quality of the effluent from the East Street Plant, she found that the waters surrounding the East Street Plant successfully met 1970s’ state standards for removing dissolved solids about half of the time and met the BOD removal standard about 50 percent of the time.\textsuperscript{195}

\textbf{B. A short interlude: sewers and local politics}

\textit{Sewer assessments}

New Haven uses front foot assessments to fund installations of new sewers (it charges user fees for existing users, based on water usage). In addition, it spread the

\textsuperscript{191} Report of the Department of Public Works (1932), \textit{in NEW HAVEN CITY YEAR BOOK OF THE CITY OF NEW HAVEN} 195 (1932). The process of towing and dumping sludge at sea was one that was well developed by 1930. For example, London had long towed its sewage – 6000 tons a day – to sea at a spot 50 miles from the city. A. Prescott Folwell, \textit{Sewerage: The Designing, Construction, and Maintenance of Sewage Systems} 393 (5th ed. 1907).

\textsuperscript{192} Report of the Department of Public Works (1932), \textit{in NEW HAVEN CITY YEAR BOOK OF THE CITY OF NEW HAVEN} at 183.


\textsuperscript{194} City Plan Commission, Communication, \textit{in} 1931 \textit{J. BOARD OF ALDERMEN OF NEW HAVEN} 66-67 (Oct. 5, 1931).

\textsuperscript{195} Engle, \textit{supra} note 8, at 28.
capital costs of the sewerage over the wards of the city. While these funding tools were necessary to support its projects, New Haven politicians also used them to great political effect.

In the 1950s, New Haven built the East Shore Plant in the 32nd ward, a semi-autonomous ward of the city.\textsuperscript{196} The 31st, 32nd, and 33rd wards joined the city after most other parts of the modern day New Haven. The 31st award joined in 1918,\textsuperscript{197} after promises that New Haven would immediate provide new sewers.\textsuperscript{198} By the mid-1940s, New Haven had not yet added sewers to the 31st, 32nd, or 33rd wards. The 32nd Ward (called the Annex) decided to hold out and not join the city. It remained a semi-autonomous region, and paid property taxes half as high as those of the rest of the wards of the city. In 1945, the Connecticut General Assembly gave New Haven the authority to tax the 32nd Ward for the capital and maintenance costs, with interest, of the to-be constructed East Shore Plant.\textsuperscript{199}

New Haven had decided that Annex should become part of the city, and it used the sewer assessments to apply some pressure. Thus, the city began charging front foot assessments of $15.13 for sewers,\textsuperscript{200} in the 32nd ward while the 31st and 33rd wards were paying the much lower $1.70 a front foot, a rate set for the city in the 1870s, though those wards paid higher property taxes. The Annex residents argued that the city was

\textsuperscript{196} Barry to Seek Bond Issue To Aid Sewer Work, NEW HAVEN REGISTER, Dec. 11, 1950. The head of the State Water Commission sought a conference with the 32nd ward’s Fairmount Association to construct a plant in their area after the war. \textit{State Board to Push Sewage Plant Plans}. NEW HAVEN REGISTER, Dec. 12, 1943.

\textsuperscript{197} Two Aldermen Oppose Higher Sewer Expense, NEW HAVEN J.-COURIER, Feb. 5, 1949.

\textsuperscript{198} Annex Residents Rally To Protest Sewer Rate, Aug. 23, 1958.


\textsuperscript{200} 400 Annex Residents Voice Protests on Proposed City Sewer Assessment, NEW HAVEN REGISTER, Dec. 9, 1958.
“blackmailing” it into joining the city.\footnote{Annex Residents Rally to Protest Sewer Rate, NEW HAVEN REGISTER, Aug. 23, 1958.} It probably was. By 1959, the Annex was part of the city, and sewer assessments fell to $3.50 a front foot, the new rate for the rest of the city.\footnote{New Sewer Charges Filed in 32nd Ward, NEW HAVEN REGISTER, June 30, 1959.}

**Combined sewer overflow projects**

New Haven is currently separating its sewers, and it does not expect to complete the more than $400 million project before 2030.\footnote{Interview with members of the GNHWPCA, supra note 39.} New Haven began planning a comprehensive effort to separate its sewers in 1981, updated the plan in 1988, but because of advances in separation technology, and the lack of sufficient funding in the intervening period, it commissioned a new report in 1997 providing a long term plan to complete the separation.\footnote{CH2MILL, supra note 85, at ES-1; Interview with members of the GNHWPCA, supra note 39.} In 1997, about 35 percent of the system was separated,\footnote{CH2MILL, supra note 85, at 1-3.} and by 2005, about 50 percent\footnote{Interview with members of the GNHWPCA, supra note 39.} (see figure 7 for a map showing the areas that are separated). In addition to the separation that has already taken place, sewers were built separated in both Westville and the City Point area as were those in the towns connected to New Haven’s sewage treatment system: Hamden, East Haven, and Woodbridge.\footnote{Id.}

As a condition of receiving federal grant money, New Haven ceded control of its sewage treatment system to an “independent” WPCA,\footnote{See supra Part VI.} while the city engineering department retained control of the combined sewer overflow project to separate the

\footnotesize{\textsuperscript{201} Annex Residents Rally to Protest Sewer Rate, NEW HAVEN REGISTER, Aug. 23, 1958. \textsuperscript{202} New Sewer Charges Filed in 32nd Ward, NEW HAVEN REGISTER, June 30, 1959. \textsuperscript{203} Interview with members of the GNHWPCA, supra note 39. \textsuperscript{204} CH2MILL, supra note 85, at ES-1; Interview with members of the GNHWPCA, supra note 39. \textsuperscript{205} CH2MILL, supra note 85, at 1-3. \textsuperscript{206} Interview with members of the GNHWPCA, supra note 39. \textsuperscript{207} Id. \textsuperscript{208} See supra Part VI.}
sewers though a cost sharing agreement with the WPCA.\textsuperscript{209} Thus, the Board of Aldermen retained a political hook over the sewage treatment system even as state funds became important in the late 1980s,\textsuperscript{210} and through the 1990s.\textsuperscript{211} Normally, when engineers open up the street to add a new sewer line and separate the sewers, it provides an opportune time to undertake other projects, including repairs to other utilities with buried systems such as gas and water, and improving and repaving streets and installing new curbs.\textsuperscript{212} Comprehensive plans for separation were redrafted several times over the 20 year period between 1980 and 2000, and because the plans were not firmly set, the alders tried influence the location of the CSO projects. As members of the WPCA noted, not many of the alders cared about the sewers. Instead, they were interested in providing surface improvements for their wards. Thus, for some years during the 1990s, political pressure appeared to drive the separation program, rather than concern for the most environmentally sensitive overflow points or for the integrity of the system.\textsuperscript{213}

Those involved in land development have long used sewers to encourage or discourage new development, demonstrating the political value of sewerage. In New

\textsuperscript{209} With the regionalization, control of the project passed to the Greater New Haven WPCA. R&C Draft, Cost Sharing Agreement for CSO (Aug. 21, 2004) (on file with New Haven Office of Management & Budget); Interview with members of the GNHWPCA, supra note 39.

\textsuperscript{210} Cardinal Engineering Associates, Inc., Update and Supplement to the Facility Plan for the Elimination of Combined Sewer Overflows I (Mar. 15, 1988) (on file with the New Haven Public Library Local History Room).

\textsuperscript{211} In 1986, Connecticut established a Clean Water Fund which is a state revolving fund that accepts federal money to help states achieve the goals of the federal clean water act. For CSO projects, the Fund provides a 50 percent grant, 50 percent loan. The federal and state money is deposited in a reserve account with the interest used to support the municipal bonds issued for the loan part of the project. New Haven’s CSO project is supported by the Fund. Connecticut Department of Environmental Protection, Clean Water Fund (2004), at http://dep.state.ct.us/wtr/cwa/cwfund.htm; Interview with members of the GNHWPCA, supra note 39.

\textsuperscript{212} See, e.g., CITY OF NEW HAVEN, FISCAL YEAR 2005-2006 BUDGET: GENERAL FUNDS, SPECIAL FUNDS AND CAPITAL PROJECTS 453 (2005) (on file with author) (explaining that the Engineering Department successfully leveraged CSO projects to improve sidewalks, roads, and drainage). The Engineering Department is also responsible for sidewalk repair.

\textsuperscript{213} Interviews with members of the Greater New Haven Regional Water Pollution Authority, supra note 39.
Haven, politicians used sewers to force annexation and to increase their political clout—certainly not an example of upgrades to sewage treatment plants in order to increase the health of the Harbor, repair damage to oyster fields, or prevent beach contamination.

VI. Federal control

By the late 1960s, New Haven had three sewage treatment plants, all of them providing primary sewage treatment: the East Street sewage plant, enlarged during the mid-1960s to treat 22-25 millions of gallons per day (mgd), the Boulevard Street plant, enlarged to treat 15 mgd in 1950, and the East Shore plant, opened in 1953. In 1980, before the upgraded East Shore treatment plant came on line, nearly two-thirds of New Haven’s 35 million gallons of sewage were treated by primary treatment methods and the effluent merely chlorinated, so the oxygen demand of the treated sewage killed fish and clouded swimming areas.

New Haven’s primary sewage treatment plants were insufficient bring the water quality in the Harbor to 1970s standards. In 1970, the Regional Planning Agency of South Central Connecticut explained that primary sewage treatment in New Haven only removed 25-40 percent of organic matter, contributing to a very polluted Harbor. Of course, there were improvements. By 1978, fecal contamination and bacterial counts in the Harbor were down from those in the late 1920s and 1930s. There was a decrease in B. Coli of 15 percentage points from 38 percent from the late 1920s to the late 1930s. As in previous studies, the 1978 study found that the inner Harbor was more contaminated

---

214 Engle, supra note 8, at 14.
215 Randolf Smith, Bacteria To Help City Clean up Its Act on Sewage, Harbor, NEW HAVEN J.-COURIER, Apr. 7, 1980.
than the outer Harbor and that tidal levels, urban runoff, and wind all significantly affected bacterial counts, making precise determination of the effect of sewage treatment on the Harbor difficult.\textsuperscript{217} A student measuring the effluent from the East Shore plant found that it was generally out of compliance with federal standards. For example, in measures of BOD, the plant was required to obtain a removal efficiency of 35 percent, which, according to sampling over two several month-long periods, was only obtained 31 percent of the time. In addition, the standard that required 45 percent of the solids removed before discharge was only obtained 55 percent of the time. In addition, the effluent had too much chlorine residual.\textsuperscript{218}

New Haven funded its transition to secondary treatment with federal grants which came with many strings attached. To accept these funds, New Haven had to create a new authority to manage its sewage treatment facilities and to receive the user fees for sewage treatment – the New Haven Water Pollution Control Authority (WPCA). Constructing a sewage treatment plant with federal funds also meant that New Haven had to wait for money as federal level disputes over budget authorizations played out. In addition, the grant program required municipalities accepting funds to set up a sewer use charge system based on water usage – as measured by the New Haven Water Company, who provided data tapes to the sewer authority for billing.\textsuperscript{219} Also, tax exempt entities were not exempt from the sewer use charge, and the EPA required them to help fund construction of facilities based on volume and grade of sewerage, or lose their grant.\textsuperscript{220}

\textsuperscript{217} Engle, \textit{supra} note 8, at 107, 112-14.
\textsuperscript{218} \textit{Id.} at 28.
\textsuperscript{219} Coopers & Lybrand, Cost of Service, Management and Rate Study (January 20, 1981) (on file with the New Haven Public Library Local History Room).
Despite all these federal requirements, New Haven managed to defeat the federal governments’ requests to site its new sewage treatment plant on lands it had reserved for economic developments, and New Haven decided to thwart the federal government’s plan by requiring an independent authority to oversee the sewage treatment plant by authorizing the Board of Aldermen as a body to serve as an “independent” Water Pollution Control Authority (WPCA) – certainly not the model of political independence from city government. Thus, even with strong federal mandates backed by with large sums of federal money, strict technology standards, and penalties for non-compliance, New Haven still managed to contravene some of the goals of the federal program.

New Haven Specific Study

The Connecticut State Water Resources Commission requested a study about possible sewage treatment upgrades to New Haven Harbor. The 1969 report, prepared by a New York engineering firm, modeled five options for improving the quality of the Harbor to target a minimum oxygen level of 5 parts per million (ppm) or 80-90 percent BOD removal. The authors considered extending the outfall further into the Harbor to allow the tidal flushing of the Harbor to obviate secondary treatment. The study concluded that each of the five options evaluated, including each option with the longer outfall, would have the same effect on the Harbor, so the choice was one of cost, not effectiveness.

Decision-making process

---

221 QUIRK, LAWLER & MATUSKY ENGINEERS, supra note 140, at S-1, 8, 18 (July 1969). The engineers required a 75 percent BOD removal if the sewage was discharged into further reaches of the harbor, using long outfalls up to 3,000 ft. Id. at 23. The study also considered adding a plant to deal with the industrial wastes of Fair Haven, but found that this did not improve the BOD demand. Id. at 24.

222 Id. at S-1, 8, 18-19.
In addition to mandating secondary sewage treatment, the CWA provided billions of dollars for municipalities to construct and plan sewage treatment plants.\textsuperscript{223} In mid-1972, the New Haven Director of Public Works submitted petitions to the Board of Aldermen to seek approval of petitions for state and federal grants for projects to increase the capacity of the East Street primary sewage treatment plant and construct secondary wastewater treatment facilities at the Boulevard and East Shore plants. The petitions were referred to the Committee on Municipal Services in September 1972 for hearings,\textsuperscript{224} and approved unanimously in October.\textsuperscript{225}

In 1972, Connecticut Governor Thomas Meskill announced that the DEP approved $3.7 million to finance plans and specifications for the new plants. Ultimately, the state was expected to contribute $16 million: 50 percent federal, 35 percent state funds, and 15 percent local, with contributions from Hamden, East Haven, Woodbridge and industries contributing wastes. Facilities were expected in operation by 1974.\textsuperscript{226}

In the early 1970s, optimism nationally and in New Haven suggested that federally funded facilities would quickly significantly reduce pollution in United States' waters. By 1974, most of the facilities remained in the planning stages. New Haven's East Shore upgrades were not finished until 1980, and the project was not completed until the mid-1980s.

Several events contributed to the delay. In 1974, President Nixon, who had opposed the Clean Water Act because of the large expenditures for sewage treatment plants,

\textsuperscript{223} Clean Water Act Title II. (providing grants for design and construction of POTW plants).
\textsuperscript{225} Municipal Services Committee Reports, in 1972 J. BOARD OF ALDERMEN OF NEW HAVEN 737-45 (Oct. 2, 1972). The Mayor was authorized to enter into a reimbursable agreement with the state by the Board of Aldermen in 1973.
\textsuperscript{226} Stanley Venoit, \$3.7 Million is Approved for City-Sewer Plans, NEW HAVEN J.-COURIER, Jan. 23, 1972
impounded federal funding for clean water projects, cutting Connecticut’s expected funds by $54.2 million for 52 projects including the $29.8 million for New Haven’s sewage treatment upgrades.\footnote{227} The East Shore project was projected to cost $28.3 million, with the federal government contributing $21.2 million. In 1974, however, a federal court forced the President to release his hold over the funds, and they flowed to municipalities, including New Haven, which received $37.2 million dollars from an Environmental Protection Agency grant.\footnote{228} State agencies, in Connecticut, the Water Compliance Division of the DEP, allocated the federal funds.\footnote{229}

Second, after the Nixon administration released the federal funds, the federal EPA’s arbitrary standards, combined with New Haven’s assertiveness further delayed the project. Under the Clean Water Act, the city sought funding for treatment works by securing a spot on a prioritized state plan of treatment works submitted to the Administrator of the EPA for approval.\footnote{230} The city’s plan to build secondary sewage at the East Shore and Boulevard Sewage Treatment Plants was rejected by the regional EPA in 1973 and 1974.\footnote{231} The EPA preferred providing secondary treatment at the East Street sewage treatment plant, instead of the Boulevard plant, because upgrading the East Street plant cost $6 million less, and the Boulevard Plant upgrades required filling several acres of tidal flats which would affect migratory birds.\footnote{232} New Haven opposed the East Street

\footnotesize

\footnote{227} Peter Clarey, Sewer Projects Face Delay, NEW HAVEN REGISTER, Jan. 12, 1974.
\footnote{228} \textit{City Gets $37.2 Million for East Shore Sewage}, NEW HAVEN REGISTER, June 19, 1975. Department of Public Works, Communications, in 1975 J. BOARD OF ALDERMEN OF NEW HAVEN 793-94 (Oct. 6, 1975). Mayor Bartholomew F. Guida said he was happy about the grant because it will provide jobs and “assist the city.” \textit{Id.}
\footnote{232} \textit{New Haven}, 424 F. Supp. at 654.
development because it would require development on “industrial use prime land” for the Long Wharf Redevelopment Area.\textsuperscript{233}

In making its decision to reject the site, the EPA had the authority to determine the “most cost effective alternative,” and choose among treatment plans by considering their present worth, non-monetary costs and capacity to meeting effluent standards.\textsuperscript{234} Rather than using this prescribed cost-benefit analysis, the deputy EPA administrator in Boston based his decision to reject New Haven’s proposal on “a rule of thumb” that he heard about from a man in his office who had heard it from “some unnamed person in Washington.”\textsuperscript{235} This rule provided that if the cost differential between two proposals exceeded $500,000, non-monetary costs could not tip the balance towards the more expensive option.\textsuperscript{236} The District court issued a declaratory judgment stating that the Administrator’s disapproval of the Boulevard site did not conform to agency guidelines and was set aside.\textsuperscript{237}

While the case was in court, the EPA ordered all New Haven projects to cease as the Boulevard sewage treatment plant court case proceeded.\textsuperscript{238} In 1975, the project was projected to take three and a half years for construction.\textsuperscript{239} Construction finally began in 1976 on reclaimed lands.\textsuperscript{240}

The District court decision required the city to explore alternatives to its wastewater management plan, and New Haven hired Metcalf & Eddy, Inc., a well-known

\textsuperscript{233} 424 F. Supp. at 650.
\textsuperscript{234} 424 F. Supp. at 654.
\textsuperscript{235} Id.
\textsuperscript{236} Id.
\textsuperscript{237} Id. at 657.
\textsuperscript{238} Carolyn Susman, \textit{Sewage Plant Gets Go-Ahead}, NEW HAVEN REGISTER, May 24, 1974.
\textsuperscript{239} Bruce Landis, \textit{Engineers Say Sewer Project up $16 Million}, NEW HAVEN REGISTER, Mar. 6, 1975.
\textsuperscript{240} $75 Million Effort to Clean Harbor NEW HAVEN REGISTER, Sept. 23, 1976.
engineering firm, to prepare an environmental assessment.\textsuperscript{241} This time, the engineering firm relied on better population statistics that those used for the earlier engineering study.\textsuperscript{242} Because the expected flow was much less because New Haven’s population was falling, New Haven could consider options other than upgrading two plants to secondary treatment.\textsuperscript{243} The firm eventually concluded that it could design a system with only one plant,\textsuperscript{244} shut down the East Street and Boulevard plants, which were still primary treatment plants, and construct pumping stations to the East Shore secondary treatment plant because the plan was more cost-effective and provided fewer noxious developments during construction by requiring only one sewage treatment plant. The state DEP approved the report and New Haven proceeded, obviating the court battle and rendering three years of delay unnecessary.\textsuperscript{245}

Construction of treatment upgrades proved problematic, especially for nearby residents suggesting the New Haven was not yet up to the challenge of providing secondary treatment, a much more complicated process than sedimentation. East Shore residents suffered during the summer of 1977 while construction crews cleaned out the 500,000 gallon “digester” tanks from the existing facility to perform a “new function.” Originally, the city was to truck the sludge to the East Street incinerator, but the trucking operation would have been onerous and the incinerator was failing.\textsuperscript{246} Crews washed the tanks and pumped the sludge to a large lagoon to allow it to dry. However, the process took much longer than anticipated. In the meanwhile, the tanks released hydrogen sulfite.


\textsuperscript{242} Interview with Robert Borus, \textit{supra} note 38.

\textsuperscript{243} \textit{Id}.

\textsuperscript{244} \textit{Id}.

\textsuperscript{245} Landino, \textit{in} 1979 J. OF THE BOARD OF ALDERMEN OF NEW HAVEN \textit{supra} note 241, at 1779-84.

\textsuperscript{246} Phil Greenvall, \textit{Those Heavy Odors Easing off As East Shore Breathes Relief}, NEW HAVEN REGISTER, Aug. 17, 1977.
and methane, though the residents were assured the horrific smell was not injurious to their health.

Later, lime was added to the sludge to reduce the smell. The sludge was not removed to the drying lagoons until September 13, 1977, and the smell continued into the following year.²⁴⁷ By August of 1978, the smell had not yet abated. In 1978, the Board of Alderman passed a resolution to resolve the problem by the end of the year. The Aldermen who represent the East Shore area expressed their thanks but noted that the smell and the application of lime presented a health problem. In addition, they noted that “the neighborhood [threatened] to march on City Hall and dump the sewage” to force the issue, but decided against it because they thought it was too much of a publicity stunt.²⁴⁸ By 1979, the city claimed that the sludge lagoons were stabilized such that the sludge could be spread at the East Shore park rather than trucked to the dump, provided that the smell did not reoccur. The Municipal Services Committee of the BOA voted 3-1 to spread the sludge.²⁴⁹ Mayor Biago DiLieto considered considering suing the designers and builders of the East Shore sewage treatment plant. As late as 1981, Residents of the Townsend and Woodward Avenues considered selling their homes rather than experience another smelly summer.²⁵⁰

The new Sewer Fund of the City of New Haven was approved in 1979 and allowed the city to charge sewer use fees to tax exempt institutions.²⁵¹ The completion of construction did not end conflict over the project. The sewer budget was a mess.

²⁴⁷ Officials Seek Solution to Sewage Plant Odor, NEW HAVEN REGISTER, Aug. 6, 1978.
²⁵⁰ City May Sue Over Sewer Odors, NEW HAVEN REGISTER, May 1, 1981.
earlier meetings, 100 residents arrived to protest the new sewer use charge screaming “pay it back.” They saw the sewer use charge as double taxation because the sewer use charge was billed separately from property taxes. The new plant was expensive – it required many more workers than the original East Shore plant. In October 1978 when the new East Shore plant opened, 13 people staffed the facility. By the time the secondary treatment improvements were finished, employment would increase to 60 people – all subject to federally written job descriptions. In mid-1980, the Board of Aldermen held a contentious extended meeting, held, oddly, at the sewage treatment plant, to try to approve the proposed sewer budget. Aldermen reported that citizens were outraged at the increase in sewer use charges, and they expressed consternation at the lack of accountability for expenditures – why secondary sewage treatment had not yet started up despite the massive cash outflow. As the meeting dragged into the night, the WPCA eventually agreed to pass the budget with a rate 7 percent below the proposed figure and aldermen urged a committee be appointed to deal with the facts of budget.

In 1981, the sewer usage rate more than doubled from 42 cents per 100 cubic feet of waste water to 93 cents. City Engineer Len Smith sent a letter to rate payers explaining their usage charge and attributed the increase to both the $47 million upgrades

---

252 Stanley J. Venoit, Disidents Charge Sewer Rates Are Assessed By Unfair Formula, NEW HAVEN REGISTER, June 25, 1980. Apparently, extreme emotions over sewer bills are not uncommon. In Chelsea, Massachusetts, part of the Massachusetts Water Resources Authority district, citizens burned copies of their sewer bills in 1993 to protest the large rate increases to support the Boston Harbor Project sewage treatment facilities. ERIC J. DOLAN, POLITICAL WATERS: THE LONG DIRTY, CONTENTIOUS, INCREDIBLY EXPENSIVE BUT EVENTUALLY TRUMPHANT HISTORY OF THE BOSTON HARBOR – A UNIQUE ENVIRONMENTAL SUCCESS STORY 156 (2004).

253 Venoit, supra note 252.

254 Peter Bilodeau & Jon Hall, "Temporaries' Man Sewage Facility, NEW HAVEN REGISTER, Apr. 21, 1980.


(of which New Haven contributed $23 million) to the sewer system and wastewater treatment facilities and the failures of the communities that use New Haven’s wastewater treatment facilities (Hamden, Woodbridge, and East Haven) to pay their bills.\textsuperscript{257} Smith further explained that New Haven had little choice in complying with the upgrades because they were needed to meet federal mandates and to ensure that “future generations can enjoy a cleaner environment.”\textsuperscript{258}

While the secondary sewage treatment system eventually worked well, it had a rocky start beyond the summers of acrid odors. In 1981, just after the plant opened, the DEP found high coliform counts outside the treatment plant because of a faulty chlorination system (though the DEP suggested that unusually low tides in 1981 may have caused some of the problem).\textsuperscript{259}

\textit{Technology}

Once it was completed in 1981, the approximately $30 million upgrades to the East Shore plant included four aeration tanks with a 10 million gallon capacity that removed about 60 percent of the suspended solids in the sewage. The resulting clarified liquid was treated with chlorine and released into the harbor.

The new upgrades used activated sludge, a process that involves biological decomposition of the sludge to reduce its volume. Because in environmental engineering, “everything is everywhere,” no bacteria are needed to seed the activated sludge operations, and the treatment plant operators controlled the bacteria present by varying the length of time the sewage remains in the treatment tanks. As the stronger carbon oxidizing bacteria decompose the organic matter, they use up the oxygen in the

\textsuperscript{257} Id.. For more on the disputes among the municipalities, see infra Part VII.B.
\textsuperscript{258} Venoit, supra note 256.
tank and allow the "weaker," ammonia oxidizing bacteria to begin to dominate, which decomposes the ammonia compounds. Further detention allows other bacterial cultures that thrive in anaerobic conditions.\footnote{See Metcalf & Eddy, Inc., supra note 77; Interview with Jordan Peccia, supra note 81.}

In addition, to allow completion of the secondary upgrades, New Haven built several pumping stations to pump the sewage from the East Street and Boulevard plants to the East Shore plant. Once the pumping stations were completed, the two primary treatment plants were shut down and the sewage flowing to them re-rerouted. Thus, in 1987 when the pumping stations were finally completed, New Haven had finally achieved the secondary treatment goals of the Clean Water Act – a goal met only 10 years behind schedule.

VII. Regional Cooperation

After looking at New Haven’s reactions to local control (slow, relatively ineffective), federal control (mired by controversy, but ultimately created a pretty workable plant), regional efforts have also contributed to increasing New Haven’s sewage treatment infrastructure, and recently, New Haven sold its sewage treatment infrastructure to a regional authority, allowing regional control.

A. Regional instigation

First, the Long Island Sound Study (LISS) and the resulting Comprehensive Conservation and Management Plan are part of a significant regional effort to reduce nitrogen emissions from sewage treatment plants into the Sound. New Haven participated in this program, and in 1997, completed tertiary upgrades to its East Shore plant that have surpassed the goals of the program for nitrogen reduction. However, this
program did not involve significant New Haven interaction – the regional approach appears to have bypassed the political machinery of New Haven. For example, to allow for public participation in the implementation of the Management Plan, the LISS program initiated “Listen to the Sound,” meetings to discuss the findings of the study and nitrogen reduction. When the LISS team came to New Haven, the public was unenthused, and barely commented or asked questions, suggesting that they were not engaged with the issue. The decision to upgrade the system came from a regional organization of New York and Connecticut, and so the political wrangling occurred on the state level. In addition, the program provided $7.4 million for the upgrades, so the city did not have to provide funds, decreasing the political pressure.

Second, while New Haven has engaged in fights with its suburban neighbors that end in costly lawsuits, the neighboring towns have occasionally been the source of beneficial prodding. In its sewerage plans of the 1920s, New Haven intended to quickly follow its East Street plant with several other plants to address the outfall from the other sewage treatment plants. However, by the mid 1930s, there was no action. Then New Haven’s neighbor, West Haven, began constructing a sewage treatment plant. West Haven residents recognized that New Haven’s sludge reached their beaches with a northeast wind, resulting in a “shocking condition of [the] beaches due to raw sewage

---

261 Anderson, supra note 9, at 177.
263 See generally, Anderson, supra note 9.
265 The 1926 report commissioned by the city recommended four sewage treatment plants to be built at the Boulevard, Meadow, East Street outfalls, and a plant on the eastern shore. Fuller & McClintock, supra note 52, at 5.
from New Haven outlets," and that the sludge could undo the benefit of a new sewage treatment plant. In response to this concern, West Haven residents circulated a petition that reached the West Haven selectmen and eventually the state Water Resources Commission. New Haven Mayor John Murphy explained that New Haven had insufficient funds to build a sewage treatment plant because of its Depression-induced relief rolls, a high rate of delinquency for tax bills, and the significant amount of non-taxable Yale property. The Commission explained that the health menace of untreated sewage, the recreational value of the adjacent waters and the irreparable damage to the shellfish industry trumped these financial concerns and ordered New Haven to construct two new sewage disposal plants. The Commission acknowledged the high cost – up to $3.5 million for two additional sewage treatment plants, but noted that it had waited six years since the construction of the East Street plant before ordering New Haven to end the "intolerable situation." To meet existing standards, the Commission order required to the city to build a plant that would chlorinate the effluent, remove not less than 30 percent of oxygen demand and 60 percent of suspended solids. Rather than build two other new plants, New Haven decided to pump sewage from the Meadow and State Street outfalls to the new Boulevard plant. In 1938, the Board of Aldermen approved

267 Id.
268 This "order" had little bite, but apparently, when combined with sufficient federal funds, enough coercive power to drive New Haven to continue building sewage treatment plants. The Commission could issue an order after public hearings, but only for the municipality to complete sewage treatment facilities that were "economically feasible." When the Connecticut House and Senate explained the rationale behind the new Clean Water Act of 1967, they explained that the Commission both under the 1925 and the 1967 acts had been ineffective in remedying cases of water pollution. See Starr v. Commissioner of Environmental Protection, 627 A.2d 1296, 1308 (Conn. 1993).
269 State Water Commission, in 1937 J. BOARD OF ALDERMEN OF NEW HAVEN, supra note 266, at 103.
270 State Water Commission, Order to the City of New Haven, in 1937 J. BOARD OF ALDERMEN OF NEW HAVEN 104 (Apr. 5, 1937).
$750,000 in Boulevard Sewage Disposal Plant bonds at 2.25 percent interest to mature until 1958.\textsuperscript{272} The federal government supplied $603,000 of the $1,345,000 for the $1.1 million Boulevard Plant and $245,000 expansions for the East Street plant,\textsuperscript{273} through a Public Works Administration grant that financed the project as long as construction was finished 18 months after the beginning of the project.\textsuperscript{274} Shortly thereafter, New Haven's used workers previously unemployed because of the Depression to construct its second sewage treatment plant, the Boulevard plant by 1938 (see figure 4 for location, and figures 8, 9 & 10 for diagrams and photos of the plant).\textsuperscript{275}

Note, however, that the interlocal instigation was probably effective because West Haven could appeal to a state body to apply pressure to New Haven, and because the federal government provided sufficient funds to jump start the project. Hence, this story is essentially one of the power of local actors to identify environmental harms and demand action from those above their jurisdiction – a model of cooperative federalism.

**B. Interlocal agreements**

An inter-local agreement is a contract between one or more governmental units generally to provide some sort of government services and is best suited for issues where each of the members benefit from the interest – which generally excludes contracts about very sensitive issues such as schools and public housing.\textsuperscript{276} The relationship between New Haven and its suburb clients from their inception in the late 1920s was described as

\textsuperscript{272} 1938 J. BOARD OF ALDERMEN NEW HAVEN 267-68 (Oct. 3, 1938).
\textsuperscript{273} John W. Murphy, Statement by the Mayor to the Board of Aldermen (1940), in CITY YEAR BOOK OF THE CITY OF NEW HAVEN 56 (1940). The Boulevard plant cost $1.1 million. Id.
\textsuperscript{274} 1938 J. BOARD OF ALDERMEN OF NEW HAVEN 177-78 (July 1, 1938).
\textsuperscript{275} John Innes, New Sewer Plant Becoming a Reality, NEW HAVEN REGISTER, Sept. 11, 1938, at G-2.
\textsuperscript{276} ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS, METROPOLITAN AMERICA: CHALLENGE TO FEDERALISM 87-88 (1966), in FRUG, FORD & BARRON, supra note 26, at 465.
one of a landlord and his tenants – an institution destined for conflict, and one city hall official involved in the lawsuits described the interactions between New Haven and the towns as “very acrimonious.” The four towns involved in the agreements with New Haven include Woodbridge, East Haven, and Hamden (see figure 1 for map). The towns are much more affluent than New Haven (see Table 1).

Table 1: Comparison of Towns in the Greater New Haven Regional Authority

<table>
<thead>
<tr>
<th></th>
<th>Per Capita Income, $20,000 (dollars)</th>
<th>Average daily sewage flow (millions of gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Haven</td>
<td>22,396</td>
<td>4.7</td>
</tr>
<tr>
<td>Woodbridge</td>
<td>40,049</td>
<td>0.5</td>
</tr>
<tr>
<td>Hamden</td>
<td>26,039</td>
<td>9.1</td>
</tr>
<tr>
<td>New Haven</td>
<td>16,393</td>
<td>19</td>
</tr>
</tbody>
</table>


New Haven often had disputes with its inter-local partners stemming from disagreements about the volumes used, or the responsibility of the client towns to pay for system-wide charges; New Haven attempted, unsuccessfully until the late 1980s, to remedy this by installing better metering devices. However, since the towns were most upset by the amount of the bills and its impact on their finances, it is likely that installing even the best metering devices may have had little effect on whether the towns

---

277 Interview with Robert Borus, supra note 38.
peacefully accepted the charges for the sewage treatment contracts.\textsuperscript{279} In addition, some of the acrimony was politically motivated as the towns tried to show that they could stand up to the demands of New Haven’s government.\textsuperscript{280}

New Haven established inter-local contracts with Hamden beginning in 1924 that were renegotiated so that Hamden residents shared part of the burden of the capital costs of new infrastructure developments like the construction of the East Shore plant in the Fairhaven neighborhood.\textsuperscript{281} In 1957, Hamden and New Haven entered into a sewer-use agreement that lasted until 1984, when the agreement was restructured between Hamden and the WPCA for capital costs and maintenance costs incurred by using the WPCA’s sewage treatment system.\textsuperscript{282} New Haven entered agreements with East Haven and Woodbridge in the 1930s.\textsuperscript{283}

Examples of the problems plaguing the inter-local contracts abound. East Haven and Hamden fought New Haven over charges related to the upgrades to the East Shore plant.\textsuperscript{284} New Haven tried to enlist East Haven in securing Hamden’s contract with the city through complex machinations. For example, New Haven held up selling excess airport land to East Haven until it reached an agreement with New Haven on sewer charges, in order to get East Haven to coerce Hamden into entering a new contract for the city; New Haven wanted the two suburbs to have contracts with the same terms.\textsuperscript{285} In

\textsuperscript{279} Interview with Frank Altieri, supra note 39.
\textsuperscript{280} Id.
\textsuperscript{281} New Sewer Contract Doubles Hamden Cost, NEW HAVEN REGISTER, June 21, 1957.
\textsuperscript{283} 1967 J. BOARD OF ALDERMEN OF NEW HAVEN 6 (Jan. 9, 1967). The date on East Haven is less certain, there were only mentions of modifications of East Haven agreement in the aldermanic journals.
\textsuperscript{284} Patricia G. Barnes, Hamden, East Haven Taking Joint Stand in Sewer-Pact Talks, NEW HAVEN REGISTER, Sept. 11, 1979.
\textsuperscript{285} See George Cubanski, Sewer Battle Stalls Land Sale at Airport, NEW HAVEN REGISTER, Oct. 18, 1981.
addition, the contract eventually negotiated between the WPCA and Hamden proved troublesome, leading to over eight years of disputes, court battles, before an eventual settlement that left many Hamden residents angered over the recalcitrance of its mayor because she could have settled for less money before the matter was taken to court. In the early years of the WPCA-Hamden contract, New Haven calculated the percentage Hamden owed by multiplying Hamden’s share of the sewage passing through the system multiplied by the net operating costs of the system. New Haven calculated net operating cost by excluding the administrative costs incurred for billing New Haven customers and the costs for the collection and pumping of most of the sewers in the system that did not involve the interceptor sewers that collected Hamden’s sewage. However, when Hamden stopped paying its bills in 1989, the WPCA retaliated by recalculating the net operating cost to include the costs for the entire system rather than just the parts that treated Hamden’s waste. Next, the WPCA stopped billing Hamden for almost two years, Hamden did not pay for that period and then underpaid the subsequent bills. The two parties arrived in court in 1995 and in 1997, unsurprisingly, the court found that New Haven had erred in including the costs for the total system in calculating Hamden’s bill, but found that Hamden owed the WPCA over $6 million. The parties eventually settled.

C. Regionalization with Woodbridge, East Haven, and Hamden

[Footnotes]

286 Interview with members of the GNHWPCA, supra note 39.
289 Id.
290 Id.
292 Id. at 12.
293 Id. at 17.
The most recent chapter in New Haven’s sewage treatment history is the
regionalization of WPCA operations to create the Greater New Haven WPCA under the
joint control of East Haven, Woodbridge, Hamden, and New Haven, in June 2005.293

The sewage treatment authority regionalization mirrors that of the New Haven Water
Company in many ways. In the mid-1970s, Connecticut adopted regulations to require
water filtration and in response, the privately owned New Haven Water Company
announced that it was selling 16,000 acres of land to raise funds in order to comply with
environmental regulations.294 Surrounding towns were outraged at the possibility of the
company selling their undeveloped land to outsiders, or allowing the development of land
that had provided a natural buffer from toxic contamination of drinking water supplies.295
Eventually, New Haven threatened to exercise its option to purchase the water
company.296 This purchase would have given New Haven control over large parts of
some towns and scared the suburbs into seriously considering a regional authority.297
New Haven backed down from its threats, and New Haven and the towns eventually form
a Regional Water Authority, comprising seventeen communities, that purchased the New
Haven Water Company.298

Similarly, the WPCA and New Haven were in a troublesome financial position
because of environmental liabilities. Increased regulations from the EPA and the state
require what is expected to be $370 million in infrastructure upgrades over the next 20

293 Carter & Gannon, supra note 308.
294 MCCLUSKEY & BENNETT, supra note 10, at 2.
295 Id. at 8, 18.
296 Id. at 19.
297 Id. at 19-23.
298 Id. at 19-21, 56. In addition to New Haven’s threats, the land sale became less desirable because a court
ruling upholding a Department of Public Utilities Control regulation requiring the company use the land-
sale profits to benefit ratepayers and not stockholders, and Connecticut passed regulations protecting
watersheds. Id. at 10, 18.
years because of the EPA's Sanitary Sewer Overflow Policy and the Long-Term Combined Sewer Overflow Control Plan, Long Island Sound project's the final phases of nitrogen reduction, and state Department of Environmental Protection (DEP) consent orders. In addition, the New Haven holds debt of the WPCA which restricts its debt ceiling – selling the assets would retire $21.8 million in general operating liabilities and $21.5 from state environmental program liabilities of New Haven debt. The GNHWPCA will receive its funds from revenue bonds – it intends to issue $19 million in the initial offering – and money from the Connecticut DEP which provides both debt and grant funding. Now, the debt will no longer affect New Haven's debt ceiling as significantly. Further, New Haven will sell its East Shore plant to the new authority for $33.2 million.

Further, the main obstacle to the regional WPCA was the question of New Haven's control of the authority. Eventually, the city proposed an authority with New Haven holding the majority of the members of the appointed board of directors of the GNHWPCA, and thus the majority of the votes. Unsurprisingly, the suburbs disagreed and eventually New Haven achieved a compromise where it holds 4 of the 9 nine positions on the board but a two-thirds majority is required for important votes such as

300 Id. at 17.
301 Slide Presentation, supra note 299. The city will continue to carry debt for its 40 percent share of the combined sewer operation program in a cost-sharing agreement with the GNHWPCA. R&C Draft, supra note 209.
303 Interview with Frank Altieri, supra note 39 (who encouraged and completed most of the negotiations for the regional WPCA); Interview with Azalea Mitch, Professional Engineer, Yale School of Forestry, in New Haven, Conn. (Mar. 22, 2005).
304 Id.
new sludge agreements,\textsuperscript{305} selling or leasing assets, or awarding a contract without public bidding.\textsuperscript{306}

The long-time head of New Haven’s WPCA, Ray Smedberg supports the plan because he sees it as reducing costs because the regional WPCA will purchase New Haven’s East Shore Treatment plant,\textsuperscript{307} for $33 million\textsuperscript{308} and because it solves New Haven’s longstanding problems with sewer fee collection from the neighboring towns.\textsuperscript{309} The staff of the GNHWPCA, as mentioned previously, is optimistic about the new agency because it believes that the battles between the suburbs will end.\textsuperscript{310} In addition, the GNHWPCA has control over the combined sewer overflow project and the aldermen will be less able to influence its implementation.\textsuperscript{311} Lastly, one organization will be responsible for the entire system, allowing the staff to concentrate one what is best for the sewerage of New Haven and for the Harbor.\textsuperscript{312}

\textsuperscript{305} The sludge issue is the environmental justice advocates primary concern with the regional WPCA. New Haven currently has long term contracts with several communities to burn sludge from their sewage treatment facilities. Forty percent of the sludge burned at the New Haven incinerator comes from outside the community. Sludge inevitably contains chemicals that, when burned, may pose a health problem. The residents of the East Shore area, and the environmental justice advocates of New Haven, would like the city to end their contracts for the health of the city. The Environmental Justice Network (EJN) of New Haven was concerned that if New Haven did not have a majority of the votes, the suburban towns could vote to increase the sludge contracts, which provide needed revenue. The EJN would have a much tougher lobbying effort without a New Haven majority both because the air quality problem does not affect the towns as much, and because New Haven currently has several alders sympathetic to the EJN. Interview with Lynne Bonnett, supra note 36.

\textsuperscript{306} New Haven Department of Management & Budget, Creation of the Greater New Haven Water Pollution Control Authority 7 (Apr. 19, 2005) (unpublished presentation, on file with author), Bass, supra note 307.


\textsuperscript{310} Id.

\textsuperscript{311} Id.

\textsuperscript{312} Id.
VIII. Conclusions

The story of New Haven’s sewage treatment development is one of money and politics – probably the story of most government programs. However, with the strong commitment to health improvements during the 1920s, widely supported environmental norms during the 1970s, one might have expected more local stewardship for the public good.\footnote{313} New sewage treatment programs stalled until there was outside instigation that forced action – especially outside instigation accompanied by federal funds. Whether West Haven’s appeals to the State Water Commission and Public Works Administration grants, the federal government mandating strict standards and providing federal funds, state and federal funding for combined sewer overflow projects, or a regional goal to prevent further increases in nitrogen emissions and commensurate funds for upgrades – each program of standards and funds advanced New Haven’s sewage treatment. As a longtime engineer of New Haven explained, any program that provides money for municipalities, especially for infrastructure improvements, is a good program.\footnote{314} In addition, he saw paperwork and state and federal government oversight as beneficial because they provided incentives for inherently cost conscious and conservative local politicians and appointees to pay attention to goals of the general public like environmental regulation in the 1970s.\footnote{315}

Similarly, in this century, costs drove New Haven’s city government to support regional governance of the WPCA. One of the reasons posited for the regionalization was that the city administration had counted the revenue from the sale of the East Shore plant to the regional authority in the revenue column of its budget even before the

\footnote{313}{Though, this is probably a consequence of the idealism of the author.}
\footnote{314}{Interview with Henry Goetz, supra note 34.}
\footnote{315}{Id.}
regionalization was approved by the Board of Aldermen. In order to make sure that the mayor did not look foolish, and in recognition that those millions were necessary to keep the city budget afloat, the Board of Aldermen approved the regionalization and the commensurate asset sale to the regional authority.\textsuperscript{316}

In evaluating the local contribution to New Haven’s sewerage, one notes that New Haven politicians showed expert skill in seeking political advantage from the sewerage system whether in seeking funds for surface improvements in their wards, or in standoffs between mayors over payment for the bills of the interlocal contracts. On the other hand, the New Haven government, without much outside influence, did successfully begin the sewage treatment system of the city. In many ways, the East Street plant was a success. The local treatment plant of the 1930s was highly tailored to New Haven’s needs, fell within its budget, and was not bonded until New Haven was fiscally ready to begin the project, which was completed within two years. Arguably, sewage treatment was not a major public issue for the citizens of New Haven, except for the oystermen, and so the time it took to research, plan and build the plant was in accord with the wishes of New Haven residents and its government who delayed the decision until there was a cost-effective solution, sufficient funds, and the problems of the Harbor and its effect on recreation were abundantly clear.

In later years, however, local control seemed only to resist the efforts of higher levels of government to impose environmental controls. New Haven residents became angry when they were asked to pay for pollution reduction or when problems at the sewage treatment plant caused odors in their neighborhoods. The public was generally

\textsuperscript{316} Interview with Anstress Farwell, President, Urban Design League and Environmental Justice Advocate, in New Haven, Conn. (Dec. 12, 2005).
not as involved in demanding pollution reduction and local politicians privileged local redevelopment plans and their own wards. In addition, even the engineers in charge of sewerage in the early days were not committed to improving the condition of the Harbor. In the 1950s, it was explained, if an environmentalist tried to infiltrate the engineer's office and encourage the city to employ a contractor with a design that reflected more than simply the lowest cost plan available, the engineer probably would have been assigned another less desirable project, or perhaps would have been shown the door.\textsuperscript{317} Eventually, this conservative attitude towards environmental projection was discordant with state and local goals, and the recalcitrance of local politicians was overcome only by strong arm measures explained above. Perhaps this suggests that the local government and its people demanded less pollution reduction than higher levels of government. If so, it is an open question whether local governments should be forced to accept programs that their public does not desire. However, what is more likely is that the public did want a cleaner Harbor, but not enough to fully fund it. Thus, higher levels of government intervention provide an appropriate solution: more money, and better environmental controls.

Finally, the regional system now developing among New Haven and the surrounding may prove to be very beneficial as the third tier of regulation. First, control of the authority will now lie in the hands of people who are only looking out for the system. The city of New Haven no longer directs the combined sewer overflow project, thereby insulating it from local control. In addition, all of the towns will be working together as partners and not as contractual members trying to reduce the amount owed New Haven. It is hoped, by the staff of the authority, by the environmental justice

\textsuperscript{317} Interview with Henry Goetz, \textit{supra} note 34.
advocates, by the city hall official who made the regional agreement possible and by engineering students who have followed the developments, that the regional authority will provide an institution of technical competence, insulated from political developments, with sufficient state and federal funding to continue to improve an already exemplary system.

From a political vantage, the regionalization, in addition to potentially reducing the acrimony of the inter-local agreements, may reduce encourage further regional efforts. Like local government scholars, local government officials are interested in more regionalization because it reduces administrative costs, increases economies of scale in both personnel and equipment, and might lead towards greater integration between the towns with very different socio-economic profiles.\textsuperscript{318} The two most difficult issues between New Haven and its surrounding towns have been the sewage contracts and the airport built on East Haven land.\textsuperscript{319} The airport moved under the control of a regional in 1999 and with the regionalization of sewage treatment, perhaps relations between the towns will finally calm to the point that more substantive equity issues can be addressed. Some are not optimistic that the schools or low income housing will ever be addressed regionally,\textsuperscript{320} but one can hope that when the tenor of discussion is calmer, more cooperation will ensue.

From an environmental vantage, the sewage treatment program is a qualified success in New Haven, as elsewhere. As some environmentalists note, the problem of sewage treatment is one that will not go away until new solutions encourage effective disposal that does not foul our waters; perhaps, even the sewage treatment plant

\textsuperscript{318} Interview with Frank Altieri, \textit{supra} note 39.
\textsuperscript{319} \textit{Id.}
\textsuperscript{320} \textit{Id.}
construction program of the Clean Water Act was a short-sighted solution that pushed back efforts to treat the root causes of water pollution rather than its effects.\textsuperscript{321} While the waterborne system has been accepted for thousands of years (the Romans had their Cloaca Maxima) perhaps the next generation solution will move away from directly fouling our waters and pouring the nutrients of the soil down into waterways. Perhaps rather than institutional mechanisms, the real answer to improved sewage treatment includes innovative efforts such as those of engineers at Ipswich who are using greenhouse plants such as banana trees to convert sewage into harmless byproducts,\textsuperscript{322} to encourage citizens to reduce their production of waterborne wastes, conserve water, and to encourage environmental engineers to develop methods to reuse sewage waste rather than dumping it directly into streams: technological solutions of the best kind.

However, until that time, regional control of New Haven's sewerage, supported by well intentioned and smart managers will continue to chip away at New Haven's water pollution problems until the Harbor will return to a state it has not seen since before E. S. Chesbrough came to New Haven and built its sewer system.

\textsuperscript{321} See Houck, \textit{supra} note 131, at 381-83 (explaining that even the idea of waterborne waste is "a little barbarie" – even very early societies understood that "one did not foul the water" and that our use of the waters for disposal founded on the mistaken premise that the system is too entrenched to change course.).

List of Figures

1. Area covered by the Greater New Haven Water Pollution Control Authority


5. Picture of East Street Plant, Source: NEW HAVEN REGISTER (on file with New Haven Public Library, Local History Room).

6. Diagram of the East Street Sewage Disposal Plant, Source: Report of the Public Works Department (1943), in NEW HAVEN CITY YEAR BOOK 83 (1943)).


8. Picture of a gas storage shell, Boulevard Plant, Source: CITY YEAR BOOK OF THE CITY OF NEW HAVEN 92 (1938). The storage shell stores excess methane gas. Sludge is allowed to digest or ripen aided by the circulation of hot water in pipe coils and produces considerable methane gas which is used to heat both the service building and the digestion tanks. Any surplus gas is admitted to a large metal ball or gas holder for storage. Report of the Public Works Department (1943), in NEW HAVEN CITY YEAR BOOK 82 (1943).


Sewerage System of New Haven. Boundaries between areas tributary to each of the five outfalls indicated by heavy lines.
Sewage Plant Four-Fifths Completed

New Haven's sewage disposal plant at the foot of East Street, the first of a series of four, and which engineers yesterday reported as 80 per cent completed will be put into operation early in January. Upper photo shows control house, while picture below shows general view of huge settling tanks still in process of construction.
Gas Storage Shell Sewage Disposal Plant