

**A CLEAR-CUT DANGER:
COMMERCIAL LOGGING THREATENS THE QUALITY OF
BOSTON’S DRINKING WATER SUPPLY**

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INTRODUCTION

The Quabbin Reservoir is a man-made wonder located at the heart of the Massachusetts public drinking water system. Constructed in the 1930s, the Quabbin remains one of the largest man-made reservoirs in the United States, as well as one of the largest unfiltered water supplies in the world.¹ The Quabbin's incredibly pure water supply provides more than 400 billion gallons of water to more than two million Massachusetts residents.² The reservoir is a beautiful sight that can be described as “[what] seems like a huge, natural idyllic creation from The Ice Age.”³ Indeed, the Quabbin lives up to its name that comes from the Nipmuck Indian word meaning “great waters.”⁴

The Quabbin Reservoir spans over thirty-nine square miles and is approximately eighteen miles long.⁵ 58,000 acres of public forestland surround and protect the watershed.⁶ In fact, the forestland around the watershed is the largest intact block of forestland in Massachusetts.⁷ This is why the Quabbin is sometimes referred to as “an accidental wilderness.”⁸ The combination of the great forest and limited human access to the area contribute to the opinion that the Quabbin is “a symbol of what things across [the United States] would have looked like if the Mayflower never landed.”⁹

The Quabbin Reservoir's importance in supplying drinking water to Massachusetts residents has forced the Massachusetts Department of Conservation and Recreation to prohibit the Reservoir's visitors from participating in any activity with the potential to harm the quality of the

1. Energy and Env'tl. Affairs, *Quabbin Reservoir*, MASS. DEPT. OF FISH AND GAME, <http://www.mass.gov/eea/agencies/dfg/dfw/maps-destinations/quabbin-reservoir.html> (last updated Nov. 9, 2013).

2. *Id.*

3. Steve Lyons, *The Quabbin Reservoir: Massachusetts History Underwater*, ONE NEW ENGLAND (May 30, 2011), <http://www.onenewengland.com/article.php?id=218&cid=3>.

4. FERN L. NESSON, GREAT WATERS: A HISTORY OF BOSTON'S WATER SUPPLY VII (1983).

5. *Quabbin Reservoir*, MASS. DEPT. OF CONSERVATION AND RECREATION, <http://www.mass.gov/eea/agencies/dcr/massparks/region-central/quabbin-reservoir.html>.

6. Chris Matera, *THE QUABBIN RESERVOIR, Boston's Drinking Water Supply*, MASS. FOREST WATCH <http://www.maforests.org/QUABBIN.pdf> (last visited Sept. 16, 2013).

7. Bradford L. Miner, *Logging in Limbo: Timber Harvesting Suspended in Watersheds*, TELEGRAM & GAZETTE, May 5, 2010, <http://www.telegram.com/article/20100505/NEWS/5050414/1101>.

8. Documentary: *Haunting the Quabbin: Inside Out*, WBUR.ORG (2005), <http://insideout.wbur.org/documentaries/hauntingquabbin/default.asp>.

9. JAN E. DIZARD, GOING WILD: HUNTING, ANIMAL RIGHTS, AND THE CONTESTED MEANING OF NATURE 9 (UNIV. OF MASS. 1999).

water.¹⁰ For example, to preserve the reservoir's water quality, visitors of the Quabbin Reservation and watershed are not allowed to swim, ice fish, ice skate, canoe, kayak, or build fires at the reservoir.¹¹ Some recreational activities, like fishing, are allowed in certain parts of the watershed; however, they are strictly regulated.¹²

The Massachusetts drinking water system relies on the Quabbin for its drinking water.¹³ In fact, almost half of the water in the Wachusett Reservoir arrives from the Quabbin.¹⁴ The system functions so that water leaves the Quabbin through the Quabbin Aqueduct and flows into the Wachusett Reservoir.¹⁵ From the Wachusett Reservoir, the water travels through the Cosgrove Tunnel to Marlborough, Massachusetts, where the Hultman Aqueduct transports the water to the Boston area.¹⁶ In this way, the Quabbin is at the core of the entire drinking water system.

The Massachusetts Water Resources Authority ("the Water Authority") governs the Quabbin and treats much of the drinking water in Massachusetts.¹⁷ The Water Authority has been responsible for delivering and distributing water to approximately forty-six communities in the Boston metropolitan area since 1895.¹⁸ The Water Authority currently has licensed treatment operators that treat the drinking water from the Quabbin and Wachusett Reservoirs in accordance with stringent federal and state regulations.¹⁹ Both the Quabbin and the Wachusett Reservoirs are kept clean through the natural filtration system that the watersheds provide.²⁰ Specifically, water that comes from rain and snow is cleaned through its contact with plants, rocks, and soil before it flows into the reservoir.²¹ The

10. 350 MASS. CODE REGS., 11.09(2), *available at* <http://www.mass.gov/eea/docs/dcr/legal/3501100.pdf>.

11. MacKenzie Clark, *No Swimming Allowed, but Logging is OK?* ENV'T. MASS. (Mar. 6, 2012), <http://www.environmentmassachusetts.org/blogs/blog/mae/no-swimming-allowed-logging-ok>.

12. *See* 350 MASS. CODE REGS., 11.09(2), *available at* <http://www.mass.gov/eea/docs/dcr/legal/3501100.pdf> (explaining that individuals may only fish in the reservoir by the shoreline or in boats that are at least twelve feet long and considered safe by the Commission representative in charge and only in areas designated for boating by the Commission).

13. *Quabbin Reservoir Fishing Guide*, MASS. DEPT. OF CONSERVATION AND RECREATION, <http://www.mass.gov/dcr/watersupply/watershed/quabfish.htm>.

14. *United States v. Mass. Water Res. Auth.*, 97 F.Supp.2d 155, 170 (D. Mass. 2000).

15. *United States v. Mass. Water Res. Auth.*, 48 F.2d 65, 68 (D. Mass. 1999).

16. *Id.*

17. *Water Quality Test Results*, MWRA ONLINE, <http://www.mwra.state.ma.us/monthly/wqupdate/qual3wq.htm> (last updated Aug. 19, 2013).

18. *Metropolitan Boston's Water System History*, MWRA ONLINE, <http://www.mwra.state.ma.us/04water/html/hist1.htm> (last updated July 02, 2013).

19. *How the MWRA Water System Works*, MWRA ONLINE, <http://www.mwra.state.ma.us/04water/html/watsys.htm> (last updated Aug. 13, 2013).

20. *Id.*

21. *Id.*

Massachusetts Department of Conservation and Recreation also tests and patrols the watersheds on a daily basis.²²

Between 2007 and 2010, timber loggers began harvesting and clear-cutting trees in the forestland around the Quabbin.²³ In particular, the loggers clear-cut large areas very close to the water's edge.²⁴ Timber logging has the potential to degrade water quality and therefore poses a risk to the Quabbin.²⁵ Logging at the Quabbin caused public outcry and as a result, Massachusetts Governor Deval Patrick placed a temporary moratorium on new logging contracts at the Quabbin in 2010.²⁶ However, preexisting logging contracts were not affected by the moratorium.²⁷ The Massachusetts Department of Conservation and Recreation's current Forest Management Plan allows logging of up to twenty-five percent "of the subwatershed forest cover in any given ten-year period."²⁸ The temporary moratorium will soon be up for review and so the question remains: Should Massachusetts permanently ban commercial logging at the Quabbin?

This note analyzes the controversy over logging at the Quabbin and discusses the consequences Massachusetts might face if it allows the logging to continue. Section I discusses the history and current condition of the Massachusetts Public Drinking Water System. Section II discusses the laws governing the commercial logging issue and the past litigation over forcing Massachusetts to install a filtration system for the Wachusett Reservoir. Section III discusses the risks of timber logging in a forested watershed and how this type of logging can impact the waters of the Quabbin, and in turn, the entire Massachusetts drinking water system. This note concludes by suggesting that the Massachusetts government should permanently ban commercial logging at the Quabbin.

I. HISTORY AND OVERVIEW OF THE MASSACHUSETTS DRINKING WATER SYSTEM

22. *Id.*

23. *Matera, supra* note 6, at 7.

24. *Id.*

25. R.M. RICE ET AL., EROSIONAL CONSEQUENCES OF TIMBER HARVESTING: AN APPRAISAL, NAT'L SYMP. ON WATERSHEDS IN TRANSITION 321, 321, *available at* <http://www.snr.arizona.edu/rnr/wsm462/Readings/Rice72.pdf>.

26. *Will Gov. Patrick Protect the Quabbin Again? At Risk: Forest That Cleans Water for Two Million*, 6 ENV'T. MASS. 1, 1 (2012), *available at* <http://environmentmassachusetts.org/sites/environment/files/Environment%20Massachusetts%20Winter%202012%20Newsletter.pdf>.

27. *Id.*

28. QUABBIN RESERVOIR WATERSHED SYSTEM: LAND MANAGEMENT PLAN 2010-2017, MASS DEPT. OF CONSERVATION AND RECREATION, *available at* <http://www.mass.gov/dcr/watersupply/watershed/documents/2007QuabbinLMP.pdf>.

A. Summary of Boston's Early Drinking Water Supply

Prior to the year 1795, Boston's drinking water came mainly from underground wells and rainwater collected in cisterns.²⁹ The Boston Common, a park in the center of the city, also provided a spring with drinking water that Boston residents frequently used.³⁰ Unfortunately, the quality of this water was extremely poor and many people became sick from drinking it.³¹ These resources also became less adequate as the city became more populated.³²

In 1795, the Aqueduct Corporation obtained a charter from the Massachusetts General Court to supply Boston with drinking water from the Jamaica Pond.³³ Through this new water system, drinking water traveled from Jamaica Pond to the city of Boston through wooden pipes made from tree trunks.³⁴ Although the Jamaica Pond system was initially successful, it became inadequate during the mid-1800s when Boston's population continued to expand and Jamaica Pond became polluted.³⁵ Furthermore, several fires broke out during this period and could not be contained because the water system lacked sufficient delivery capacity.³⁶ With these new problems, the city of Boston realized that it needed to find a new water source.

The Cochituate Board began constructing the Cochituate Water System in 1846 to meet Boston's high water supply demands.³⁷ The Board seized the Sudbury River to create Lake Cochituate, a seventeen-mile watershed with the capacity to hold two billion gallons of water. The Cochituate Aqueduct transported water from Lake Cochituate to the Brookline Reservoir, which had lead cast iron pipelines that connected to small distribution reservoirs in different parts of the Boston area.³⁸

The Cochituate system was a huge success that cost approximately four million dollars to build.³⁹ When the Cochituate System was completed in 1848, the city of Boston celebrated by declaring a holiday and hosting a ceremony on the Boston Common.⁴⁰ The completion of the Cochituate

29. NESSON, *supra* note 4, at 1.

30. *Metropolitan Boston's Water System History*, *supra* note 18, at 1.

31. NESSON, *supra* note 4, at 1.

32. *Id.*

33. *Id.*

34. *Metropolitan Boston's Water System History*, *supra* note 18.

35. *Id.*

36. *Id.*

37. NESSON, *supra* note 4, at 6.

38. *Id.*

39. *Id.*

40. *Id.* at 7.

Water System marked two significant accomplishments for the city of Boston. First, Boston never again experienced a water shortage.⁴¹ Second, Boston did not experience any epidemics of disease because the city eliminated problems with the transmission of typhoid, cholera, and typhoid bacilli by purifying its drinking water source.⁴² In this way, the completion of the Cochituate System marked a new era for Boston's drinking water.

B. The Construction of Boston's Current Water System

1. The Wachusett Reservoir

Boston's population expanded significantly between the late 1840s and the 1890s, likely as a result of immigration.⁴³ At this time, indoor plumbing was becoming common, and the city once again had to face the issue that its water supply was no longer meeting the demands of the city's population.⁴⁴ The Metropolitan District Commission considered many out of state water sources in northern New England in its search for a new drinking water supply before deciding to build the Wachusett Reservoir in central Massachusetts.⁴⁵ The state had to flood areas in four different towns during the construction.⁴⁶ At the time that it was built, the Wachusett Reservoir was the largest public water reservoir in the world.⁴⁷

The Wachusett Reservoir had many benefits to offer the city of Boston. Primarily, the construction of the water system was the easiest means of expanding the city's current water supply because it only required connecting the new water supply to previously existing water pipes.⁴⁸ Furthermore, the Wachusett Reservoir's water quality was excellent because the Commission designed it to be a very large and deep reservoir and purchased the watershed around it to ensure purity.⁴⁹ This allowed Massachusetts to avoid installing filtration for the reservoir, which was an important consideration at this time because filtration was a new technique and the technology that it involved could easily malfunction and create problems.⁵⁰ The construction of the Wachusett was also somewhat inexpensive because it was so large that multiple communities shared the

41. *Id.* at 8.

42. *Id.*

43. *Metropolitan Boston's Water System History*, *supra* note 18.

44. *Id.*

45. *Id.*

46. *Id.*

47. *Id.*

48. NESSON, *supra* note 4, at 32.

49. *Id.*

50. *Id.*

costs and thus Boston did not have to bear the burden of paying for the system alone.⁵¹ Lastly, the Wachusett system depended on dams and aqueducts rather than machinery and therefore would have a “long useful life” with a value that would not depreciate.⁵²

2. Overview of the Quabbin Reservoir

a. *Early Settlement of the Swift River Valley and Construction of the Quabbin*

Prior to the European Settlement of the United States, the area that is now the Quabbin was simply a “low valley cut by a river.”⁵³ Specifically, the Quabbin Reservoir is located in the former Swift River Valley.⁵⁴ Europeans first settled in the Swift River Valley around the year 1754.⁵⁵ By the time of the industrial revolution, the valley had between two and three thousand residents spread throughout four towns: Dana, Enfield, Greenwich, and Prescott.⁵⁶

Despite World War I’s delay on the population growth in Massachusetts, Boston realized that it would need a new water supply by the 1930s.⁵⁷ The Commission searched westward for new water sources and landed in the Swift River Valley in the early 1900s.⁵⁸ The Swift River Valley’s landscape made it an ideal location for a water reservoir.⁵⁹ Moreover, the state had the “budgetary and technical capabilities” to build tunnels and aqueducts that would connect the reservoir to the previously existing water storage and distribution networks.⁶⁰ In this way, the Swift River Valley was the perfect location for a reservoir.

The Quabbin Reservoir’s construction required the relocation of six town boundaries and eliminated the four towns in the Swift River Valley.⁶¹ The reservoir displaced approximately 2,500 residents of the valley who were forced to sacrifice their homes for the greater good of the people of

51. *Id.*

52. *Id.*

53. *Haunting the Quabbin: Inside Out*, *supra* note 8.

54. Ben Cosgrove, *Drowned Towns: Preserving the Lost Communities of the Swift River Valley*, HARVARD ADVOCATE Winter 2009, available at <http://www.theharvardadvocate.com/content/drowned-towns-preserving-lost-communities-swift-river-valley>.

55. DIZARD, *supra* note 9, at 5.

56. *Id.* at 6.

57. *Id.* at 36.

58. *Id.* at 38.

59. *Id.* at 6.

60. *Id.*

61. *Metropolitan Boston’s Water System History*, *supra* note 18.

Massachusetts.⁶² Many of these residents were extremely angry over losing their homes and felt that they were simply “thrown out” and forced to give up everything they knew by a “political machine” in Boston.⁶³ Although the residents first learned of the state’s plans to build a reservoir about thirty years before the construction began, many did not believe that they would actually lose their homes.⁶⁴

In April of 1927, the Massachusetts legislature passed the Swift River Act, which provided funding for the construction of the Quabbin.⁶⁵ As a result, the residents of the Swift River Valley began to face the fact that they needed to find new homes.⁶⁶ Although the state compensated the residents of the towns for their property, many residents felt that they were “short-changed” and not given enough money because they had no option not to sell.⁶⁷ By the spring of 1938, the population of the Swift River Valley had dwindled to only a few hundred.⁶⁸ On April 27, 1938, the town of Enfield hosted a “Farewell Ball” at the town hall to celebrate the last night before the town ceased to exist.⁶⁹ The state began filling the valley on August 14, 1939, and continued until the reservoir was completed in 1946.⁷⁰ The Reservoir filled to capacity at approximately 412 billion gallons.⁷¹

b. The Present State of the Quabbin

Since 1928, the state has closely monitored the land around the Quabbin to provide as much buffer, filtration, and insulation from human activity as possible.⁷² The layout of the Massachusetts drinking water system leaves the forest surrounding the Quabbin as the first barrier to pollution at the water supply’s source.⁷³ In 1998, the Commission designed and implemented a plan to restructure the forest and in turn enhance the watershed’s protection.⁷⁴ The Quabbin is the only reservoir of its size that

62. *Haunting the Quabbin: Inside Out*, *supra* note 8.

63. *Id.*

64. *Id.*

65. Cosgrove, *supra* note 54.

66. *Haunting the Quabbin: Inside Out*, *supra* note 8.

67. *Id.*

68. *Id.*

69. *Id.*

70. *Metropolitan Boston’s Water System History*, *supra* note 18.

71. *Id.*

72. DIZARD, *supra* note 9, at 4.

73. Paul K. Barten et al., *Massachusetts: Managing a Watershed Protection Forest*, 96 J. FORESTRY 8, 10 (1998), available at http://foreststofaucets.info/wp-content/uploads/2010/09/Barten_etal_JF98.pdf.

74. *Id.*

does not require filtration because the forest's hydrology prevents sediment and other uninvited elements from reaching the water.⁷⁵ Furthermore, the water in the reservoir remains pure because there are no large populations or industrial centers nearby, nor along the streams that flow into the reservoir.⁷⁶ The Department of Conservation and Recreation manages the forest area with the purpose of preventing water erosion, which would wash silt into the reservoir.⁷⁷

The development of Massachusetts' current drinking water system began in 1795 and was not completed until the Quabbin filled to capacity in 1946.⁷⁸ Because the state purposely designed the Quabbin to not require filtration, the state must consistently monitor and regulate the reservoir to ensure that the water maintains its purity.⁷⁹ The combination of the regulation of the Quabbin's water and its natural seclusion from human activity allows it to remain an accidental wilderness.

II. THE PUSH FOR FILTRATION UNDER THE SAFE DRINKING WATER ACT

A. The Need for Regulation

The public depends on its drinking water suppliers to maintain clean and safe drinking water.⁸⁰ As a result, the Safe Drinking Water Act and the Surface Water Treatment Rule collectively require water suppliers to filter water before it reaches consumers.⁸¹ In order to bypass filtration, a water system must meet certain avoidance criteria, which is difficult to do.⁸² For example, avoidance criteria include, but are not limited to, sustaining a watershed control program, identifying and monitoring activities that could have a negative effect on water quality, and allowing on-site inspection and access to both the watershed control program and disinfection treatment process. Consequently, after the Surface Water Treatment rule was enacted,

75. *Management and Hydrology of the Quabbin*, AMHERST COLLEGE, <http://www3.amherst.edu/~ccsp01/Management.html>.

76. DIZARD, *supra* note 9, at 7.

77. *Management and Hydrology of the Quabbin*, *supra* note 75.

78. See *Metropolitan Boston's Water System History*, *supra* note 18 (summarizing Boston's Water System's History from early Boston until the present day).

79. *Id.*

80. James Kavanaugh, *To Filter or not to Filter: A Discussion and Analysis of the Massachusetts Filtration Conflict in the Context of the Safe Drinking Water Act*, 26 B.C. ENVTL. AFF. L. REV. 809, 810 (1999).

81. Edward J. Messina, *Filtration Avoidance Under the Safe Drinking Water Act*, 19 VT. L. REV. 557, 567 (1995).

82. *Id.* at 568-69.

many public water suppliers were forced to choose between meeting these avoidance criteria and building expensive filtration systems.⁸³

1. Safe Drinking Water Act

Congress passed the Safe Drinking Water Act (“the Act”) in 1974 to safeguard public health by regulating the country’s public drinking water supply.⁸⁴ The Act allows the Environmental Protection Agency (“EPA”) to establish drinking water standards to protect against both man-made and natural pollutants.⁸⁵ The Act applies to all above ground and underground water sources that could potentially be used for drinking water.⁸⁶ The legislature amended the Act in 1986 and 1996 to reflect necessary actions to protect drinking water and its sources including rivers, lakes, reservoirs, springs, and ground water wells.⁸⁷ The 1986 Amendment was a result of Congress’s decision that filtration is the best method for removing bacterial and viral pollutants from water.⁸⁸ Under the Act, the EPA sets minimum guidelines for states to defend underground drinking water sources from contamination by underground injection of fluids.⁸⁹ The 1996 Amendments to the Act relaxed the filtration avoidance criteria for water systems “having uninhabited, undeveloped watersheds in consolidated ownership, and having control over, access to, and activities in, those watersheds” if a state decides that different methods of treatment will remove a higher number of pathogens from drinking water than filtration will.⁹⁰

83. See *id.* at 569 (explaining that Surface Water Treatment Rule requires approximately “10,000 water supply systems install improve their filtration systems at a cost of [three billion dollars]”).

84. Laws & Regulations, *Summary of the Safe Drinking Water Act*, ENV’T L. PROT. AGENCY, www2.epa.gov/laws-regulations/summary-safe-drinking-water-act (last updated Jul. 26, 2013).

85. *Id.*

86. *Id.*

87. *Id.*

88. *United States v. Mass. Water Res. Auth.*, 48 F.2d 65, 67 (D. Mass. 1999).

89. *Summary of the Safe Drinking Water Act*, *supra* note 84; see *Ground Water Discharges*, ENV’T L. PROT. AGENCY, http://www.epa.gov/region1/eco/drinkwater/pc_groundwater_discharges.html (last updated Dec. 12, 2012) (articulating that “underground injection of fluids” occurs when underground wells discharge wastes that could flow into an underground drinking water source).

90. 42 U.S.C. § 300g-1(b)(7)(C)(v)(iii)(2006); *Mass. Water Res. Auth.*, 97 F.Supp.2d at 167.

2. Surface Water Treatment Rule

Under the Safe Drinking Water Act, the EPA is allowed to dictate the criteria by which a public water supplier must filter its drinking water.⁹¹ To meet these criteria, the EPA developed the Surface Water Treatment Rule (“the Rule”) in 1989.⁹² The Rule seeks to prevent waterborne diseases caused by viruses such as *Giardia lamblia*.⁹³ The Rule requires water systems to filter and disinfect water from surface water sources to decrease the prevalence of unsafe levels of these microbes.⁹⁴

The EPA intended the Surface Water Treatment Rule to be “self-implementing” in that it required water systems that did not meet the filtration avoidance criteria to install filtration treatment facilities by June 29, 1993.⁹⁵ However, a water system could receive a filtration waiver if it proved that it met eleven necessary avoidance criteria under 40 C.F.R. § 141.71(a) and C.F.R. § 141.71(b).⁹⁶ First, the avoidance criteria listed in 40 C.F.R. § 141.71(a) dictate that the water’s fecal coliform concentration must have no more than twenty colony-forming units per 100 milliliters during any six-month period.⁹⁷ Second, the turbidity level of the water cannot exceed five nephelometric turbidity units in samples taken prior to the first point of disinfection.⁹⁸ C.F.R. § 141.71(b) lists four separate criteria to establish minimum levels of disinfection for a water supply and five additional criteria involving the watershed protection and systems operations.⁹⁹ If a water system met the avoidance criteria after the Rule was implemented but then later fell out of compliance, it had to begin filtration within eighteen months from the date of noncompliance.¹⁰⁰ The EPA issued internal guidance in 1992 that allowed state enforcement agencies to have discretion to defer a final filtration determination if it appeared that a water

91. 42 U.S.C. § 300g-1(b)(7)(C)(i) (2006).

92. 40 C.F.R. §§ 141.71–141.75 (1998).

93. *See id.* § 141.71(b)(2) (stating that watershed control programs must minimize the potential for *Giardia lamblia* in water sources).

94. *Summary of the Safe Drinking Water Act*, *supra* note 84.

95. Mass. Water Res. Auth., 48 F.2d at 67.; *see Effect on Health: Fecal Coliform Bacteria in Water*, S.C. DEP’T OF HEALTH AND ENVTL CONTROL, <http://www.scdhec.gov/environment/envhealth/septic/fecal-coliform-bacteria-in-water.htm> (last visited Mar. 2, 2013) (defining fecal coliform concentration as bacteria found in the intestines of warm-blooded animals; explaining that fecal coliform in water is dangerous because it suggests that human or animal waste has been present).

96. Mass. Water Res. Auth., 48 F.2d at 67.

97. 40 C.F.R. § 141.71(a)(1).

98. 40 C.F.R. § 141.71(a); “turbidity” is a measure of water clarity. IMPORTANCE OF TURBIDITY 7-1, ENVTL. PROT. AGENCY GUIDANCE MANUAL (Apr. 1999), *available at* http://www.epa.gov/ogwdw/mdbp/pdf/turbidity/chap_07.pdf.

99. Mass. Water Res. Auth., 97 F.Supp.2d at 166–67.

100. Mass. Water Res. Auth., 48 F.2d at 66.

system could bring itself into compliance with the avoidance criteria through immediate measures.¹⁰¹

B. Conflict over Filtration

The issue of filtration of the Wachusett Reservoir was a constant subject of litigation after Congress passed the Surface Water Treatment Rule. In 1991, the Massachusetts Water Resources Authority's ("Water Authority") Board of Directors determined that the Wachusett would not be able to meet the required filtration avoidance criteria under C.F.R. § 141.71(a).¹⁰² Consequently, on January 24, 1992, the Massachusetts Department of Environmental Protection ordered the Water Authority to provide filtration and disinfection treatment for the reservoir by June 30, 1993.¹⁰³ Following this determination, the Massachusetts Department of Environmental Protection and the Water Authority negotiated an Administrative Consent Order ("the Order") to bring Massachusetts into compliance with the Surface Water Treatment Rule.¹⁰⁴ Under the Order, the Water Authority and the Commission were required to prepare a Watershed Protection Plan for the Wachusett Reservoir and take actions needed to bring the system into compliance with the filtration avoidance criteria.¹⁰⁵ The Order also contained a reopener clause that allowed the Water Authority to pursue a "redetermination of filtration avoidance" by August 3, 1998, which set a deadline for compliance.¹⁰⁶ Meanwhile, the Massachusetts Department of Environmental Protection required the Water Authority to take steps to install a filtration and disinfection treatment facility for the Wachusett Reservoir by December 31, 2001, in the case that the avoidance strategy was unsuccessful.¹⁰⁷ The EPA expressed that it was not bound by the Order, but it still allowed the Water Authority to prove that it could meet the necessary avoidance criteria by the August 1998 deadline.¹⁰⁸

In early 1997, the EPA expressed concerns that the Water Authority was not meeting the deadlines of the Order.¹⁰⁹ On October 1, 1997, the Water Authority and the Commission filed their request for a

101. *Id.*
102. *Id.*
103. *Id.*
104. *Id.*
105. *Id.* at 65.
106. *Id.* at 69.
107. *Id.*
108. *Id.*
109. *Id.* at 70.

redetermination of filtration avoidance.¹¹⁰ On December 9, 1997, the EPA Regional Administrator wrote a letter to the Massachusetts Department of Environmental Protection and the Water Authority stating that the EPA requested that the Department of Justice file an enforcement action because the Water Authority failed to meet the filtration avoidance criteria by December 1, 1991.¹¹¹

On February 12, 1998, the United States sued the Water Authority and the Commission on behalf of the EPA. The EPA alleged violations of the Safe Drinking Water Act and Surface Water Treatment Rule because the Water Authority did not filter the Wachusett Reservoir.¹¹² It sought injunctive relief in the form of an order requiring the Water Authority to construct a filtration plant to treat water that it sources from the Wachusett Reservoir to supply customers in the metropolitan Boston area.¹¹³

The court permitted preliminary discovery but also waited on the Massachusetts Department of Environmental Protection's decision on the Water Authority's request for an avoidance determination.¹¹⁴ On November 13, 1998, the Department of Environmental Protection determined that the Water Authority's water system met the necessary avoidance criteria.¹¹⁵ Despite this determination, the fecal coliform concentrations in the water at the Cosgrove Intake of the Wachusett Reservoir surpassed twenty coliform colony-forming units per 100 milliliters of water in more than ten percent of measures taken in the six-month period ending in January of 1999 and thus violated C.F.R. § 141.71(a).¹¹⁶

The Water Authority conceded that it violated C.F.R. § 141.71(a); however, it argued that its methods of treating its water were a cost-efficient alternative to filtration.¹¹⁷ The United States District Court for the District of Massachusetts granted the EPA's motion for partial summary judgment, holding that Massachusetts was in violation of the Surface Water Treatment Rule.¹¹⁸ However, the court denied the EPA's request for an injunction, holding that an injunction was not warranted.¹¹⁹ The court rejected the EPA's argument that there was no alternative other than to force the Water Authority to filter its drinking water and held that the Safe

110. *Id.*
111. *Id.*
112. *Id.* at 66.
113. *Id.*
114. *Id.* at 70.
115. *Id.*
116. *Id.*
117. *Id.* at 66.
118. *Id.* at 72.
119. *Id.*

Drinking Water Act is broad and does not force a court to limit itself to “mechanical enforcement of EPA compliance orders.”¹²⁰ The court remanded on the issue of whether the Water Authority’s alternative strategies for keeping its drinking water clean better served Congress’s objective of “providing maximum feasible protection of the public health” than filtration.¹²¹

The EPA petitioned for interlocutory review of the court’s decision, which the court of appeals denied.¹²² The district court then held twenty-four days of evidentiary hearings to weigh the EPA’s request for an injunction against the Water Authority’s alternatives to filtration.¹²³ During these hearings, the Water Authority argued that its methods for treating its water with ozone, paired with aggressive watershed protection and an accelerated program to replace aging pipes, was more cost-effective than filtration.¹²⁴ The Water Authority also argued that installing a filtration system would lessen public support for the Watershed Protection Plan and would pressure the state to allow general recreational use at its watersheds, which would pose a grave risk to water quality.¹²⁵ The court considered both the opposing demands for limited resources and the risk from all potential threats to the safety of the state’s drinking water and determined that the Water Authority’s methods of treating its water provided a good alternative to filtration.¹²⁶ Accordingly, the court denied the EPA’s request for an interim order for injunctive relief.¹²⁷ The court also ordered that the Water Authority give notice of any future violations of the avoidance criteria and retained jurisdiction for the limited purpose of deciding whether an injunction would be warranted at some future date.¹²⁸

The EPA appealed the district court’s refusal to grant injunctive relief to the United States Court of Appeals for the First Circuit.¹²⁹ Specifically, the EPA argued that under the Safe Drinking Water Act, the court does not have any discretion to withhold filtration indefinitely as long as the plaintiff proves a public water system has violated a substantive requirement of the Act.¹³⁰ The First Circuit rejected this argument and affirmed the district court’s decision, holding that the court exercised its equitable discretion to

120. *Id.* at 71.

121. *Id.* at 72.

122. Mass. Water Res. Auth., 97 F.Supp.2d at 157.

123. *Id.*

124. *Id.*

125. *Id.* at 187–88.

126. *Id.* at 189.

127. *Id.*

128. *Id.*

129. United States v. Mass. Water Res. Auth., 256 F.3d 36, 47 (1st Cir. 2001).

130. *Id.*

further the substantive purposes of the Safe Drinking Water Act.¹³¹ The First Circuit reasoned that the district court acted within the scope of its authority with respect to the Act at issue.¹³²

C. The Dangers of Logging in Light of the Litigation over the Wachusett Reservoir

The controversy between the Water Authority and the Environmental Protection Agency EPA sheds light on the issue of commercial logging at the Quabbin because the court's decision rested on the Water Authority's continuing ability to maintain the purity of its water system.¹³³ Because the Quabbin supplies approximately half of the water in the Wachusett, the high quality of the Quabbin was a significant factor leading to this decision.¹³⁴ In fact, the district court expressly stated that "[t]here are no issues affecting the quality of the Quabbin Reservoir" as one of the factors leading to its decision.¹³⁵ In this way, the quality of the Quabbin is an integral part of the overall quality of the entire water system.

Unlike the water in the Wachusett Reservoir, the water in the Quabbin Reservoir has continually met the EPA's filtration avoidance criteria and has not been subject to the same type of litigation.¹³⁶ Accordingly, the EPA and the Massachusetts Department of Environmental Protection granted the Quabbin a filtration waiver in January of 1992.¹³⁷ The Division of Water Supply Protection of the Massachusetts Department of Conservation and Recreation manages the Quabbin and the surrounding area to preserve its excellent quality.¹³⁸ To remain in compliance with its filtration waiver, the Water Authority monitors the bacterial quality of Quabbin Reservoir water at a point prior to disinfection on a daily basis.¹³⁹

The dangers that logging may lower the Quabbin's water quality in light of a potential filtration lawsuit are numerous. If commercial logging compromises the quality of the Quabbin, the quality of the Wachusett will

131. *Id.* at 58.

132. *Id.*

133. *See* Mass. Water Res. Auth., 97 F.Supp.2d at 187 (articulating that the Massachusetts water system is "of continuing improvement" and that the Water Authority has effectively prevented contamination of the water).

134. *See id.* at 170 (stating that half of the water in the Wachusett comes from the Quabbin).

135. *Id.* at 188.

136. WATER QUALITY REPORT: 2011 QUABBIN RESERVOIR WATERSHED WARE RIVER WATERSHED i, MASS. DEP'T. OF CONSERVATION AND RECREATION (Jul. 2011) *available at* <http://www.mass.gov/eea/docs/dcr/watersupply/watershed/2011quabbinwqreport.pdf>.

137. Mass. Water Res. Auth., 97 F.Supp.2d at 177.

138. WATER QUALITY REPORT: 2011, *supra* note 136, at 13.

139. *Id.*

also be compromised. Because the court expressly retained jurisdiction on the issue of filtration, it could choose to revisit the issue if the water system's overall quality is lowered. Consequently, if the state continues to allow logging at the Quabbin and the system's water quality is lowered, the court can require the Water Authority to implement a costly filtration system for the Wachusett and the Quabbin.

In addition to its cost, implementing a filtration system for its water reservoirs will cause further difficulty to the state of Massachusetts in regulating activity and restricting access to the Quabbin.¹⁴⁰ As a natural wilderness, the Quabbin is an ideal location for those interested in recreational activities such as hunting, fishing, sailing, swimming, and cross-country skiing.¹⁴¹ However, the state placed heavy restrictions on these activities to protect the Quabbin's water quality and preserve the wildlife in the watershed.¹⁴² Without the water quality motivation, the state will likely have a difficult time restricting access to the Quabbin and balancing the interests of the recreationalists and environmentalists.¹⁴³ For these reasons, the state should be extremely hesitant to allow any activity that might harm the Quabbin's water quality.

III. COMMERCIAL LOGGING AND THE WATERSHED PROTECTION ACT

A. *Overview of the Commercial Logging Controversy*

Environmentalists and foresters consistently disagree over the harms and benefits of timber logging and the best way to manage a forest.¹⁴⁴ Most environmentalists see timber logging as a "human-caused disturbance" that poses a significant threat to water quality.¹⁴⁵ In contrast, foresters believe that timber harvesting can provide many benefits, including but not limited to: maintaining forest health and resiliency, controlling damage by natural causes, reducing the risk of wildfires, and improving the habitat for animals.¹⁴⁶ Moreover, commercial harvesting provides economic benefits as the wood products and paper manufacturing sector employ approximately

140. DIZARD, *supra* note 9, at 13.

141. *Id.*

142. *Id.*

143. *Id.* at X.

144. RICE ET AL., *supra* note 25, at 321.

145. Aregai Teclé et al., *Water Quality in Forested Watersheds of the Southeastern United States*, 35 J. ARIZ-NEV. ACAD. SCI. 48, 49 (2003).

146. TIMBER HARVESTING ON FEDERAL, STATE, AND OTHER PUBLIC FOREST LANDS 1-2, SOC'Y OF AM. FORESTERS, *available at* http://www.eforester.org/fp/documents/timber_harvesting.pdf (last updated Jun. 12, 2012).

900,000 individuals.¹⁴⁷ Both of these views bring important perspective to the issue of commercial logging at the Quabbin. Therefore, Massachusetts should weigh all of these factors in light of the situation at the Quabbin and come to a conclusion about commercial logging that is for the greater good of the state and its people.

The general consensus from the environmental perspective is that commercial logging has more risks than benefits.¹⁴⁸ First, forestry procedures can lower several water quality factors in watersheds if the procedures are not performed with sufficient controls.¹⁴⁹ Second, vehicles that access and move machinery used in logging can cause soil compaction, soil disturbance, and direct disturbance of stream channels.¹⁵⁰ In sum, logging operation planning, soil and cover type, and slope are extremely significant factors that influence the impacts of timber harvesting on water quality.¹⁵¹ Environmentalists are particularly opposed to clear-cutting, which is a particular type of timber logging that involves “the removal of all trees from a given tract of forest.”¹⁵² Environmentalists view clear-cutting as “an ecological tragedy” because it can destroy an area’s ecological integrity.¹⁵³ In this way, environmentalists generally feel that there is really no value to clear-cutting.¹⁵⁴

The rationale supporting timber harvesting is based on the approach of preventing damage to forests from natural disturbances.¹⁵⁵ Essentially, forests are at risk for two main types of natural disturbances: various types of windstorms and outbreaks of pests and pathogens.¹⁵⁶ Many experts believe that using timber harvesting as a preemptive method will enable the forests to become more resilient to storms and in turn lessen the damage to forests when these disturbances occur.¹⁵⁷ Therefore, many foresters believe that preemptive harvesting is necessary to ensure the viability of forests.

147. *Id.* at 3.

148. David R. Foster & David A. Orwig, *Preemptive and Salvage Harvesting of New England Forests: When Doing Nothing is a Viable Alternative*, 20 CONSERVATION BIOLOGY 959, 968 (2006).

149. ENVTL. PROT. AGENCY, NATIONAL MANAGEMENT MEASURES TO CONTROL NONPOINT SOURCE POLLUTION FROM FORESTRY 2-9 (2005), available at http://water.epa.gov/polwaste/nps/forestry/upload/2005_05_09_NPS_forestrygmt_guidance.pdf.

150. *Id.* at 2–3.

151. *Id.* at 2–18.

152. *What is clearcutting*, NATURAL RES. DEF. COUNSEL, <http://www.nrdc.org/land/forests/fcut.asp>.

153. *Id.*

154. *Id.*

155. Foster & Orwig, *supra* note 148, at 960.

156. *Id.*

157. *Id.*

In 2007, the Department of Conservation and Recreation implemented a new logging plan that allowed for more logging at the Quabbin.¹⁵⁸ The goal of the plan was to create “a mosaic of diverse size, age and species of trees to enhance the watershed's resistance and resilience to disturbances, including wind, snow and ice, diseases, insects and climate change.”¹⁵⁹ In this way, the plan caters to the forester view of preemptive logging.¹⁶⁰ The plan permits logging on 47,000 out of the 58,000 acres of forestland around the Quabbin.¹⁶¹ As a result of the new logging plan, loggers began to cut more aggressively and clear-cut close to the waters' edge.¹⁶²

Supporters of the logging plan at the Quabbin believe that it is adequately regulated and beneficial to the forest. For example, Chester S. Lubelczyk, who cuts down firewood in the Quabbin for a living, explained to a local newspaper that the logging at the Quabbin has adequate controls as the Department of Conservation and Recreation strictly regulates when and where loggers can cut.¹⁶³ Specifically, Mr. Lubelczyk stated that the regulations are “more intense” than ever:

You cut only the trees that are marked, use only the landing sites designated, only the equipment prescribed. You don't leave any gas cans lying around and nothing better be leaking oil. If the roads to your lot are muddy, you don't cut. If it's raining you don't cut. I've been doing this for [twenty] years and they still check on me frequently.¹⁶⁴

Despite this regulation, Mr. Lubelczyk acknowledged that although his work consisted of “mostly thinning stands of hardwoods” at one time, his most recent tasks have involved clear-cutting areas of up to two acres.¹⁶⁵ Furthermore, forestry officials admitted that in addition to violating “their own rules,” they did not sufficiently inform the public about the scope of their harvesting.¹⁶⁶

158. Madera, *supra* note 6, at 7.

159. Miner, *supra* note 7, at 2.

160. *Id.*

161. *Id.*

162. See Madera, *supra* note 6, at 7–9 (showing pictures of areas where clear cutting occurred, including an aerial view of the Prescott Peninsula of the Quabbin).

163. Miner, *supra* note 7, at 1.

164. *Id.*

165. *Id.*

166. Beth Daley, *A Clear-cut Controversy: Some Logging Halted After Outcry over Mass. Forestry Mistakes*, BOSTON GLOBE, Mar. 4, 2010, http://www.boston.com/lifestyle/green/articles/2010/03/04/a_clear_cut_controversy/.

Jonathan Yeo, the director of the Department of Conservation and Recreation's Division of Water Supply Protection, defended the forester's clear-cuts under a preemptive harvesting rationale. Mr. Yeo argued that the cuts create sunny areas that can rapidly regenerate a "diverse forest" and in turn help a range of plant and animal species thrive and better withstand storms and pests.¹⁶⁷ While preemptive harvesting is a logical way to preserve forests, forests in New England do not often have outbreaks of pests that "lead to large accumulations of hazardous fuels" such as forests in the western or southern parts of the country.¹⁶⁸ Moreover, preemptive harvesting in preparation for natural disturbances can sometimes have a greater impact on a forest ecosystem than the actual disturbance.¹⁶⁹ Furthermore, there is only a relatively low risk of wind disturbances leading to wildfires in the northeast.¹⁷⁰ For these reasons, refraining from preemptive harvesting seems to be the best approach to managing forests in New England.

B. The Watershed Protection Act as Applied to Commercial Logging at the Quabbin

The Massachusetts Watershed Protection Act governs watersheds in Massachusetts. Specifically, the Act restricts land use and activities within the Quabbin Reservoir, Wachusett Reservoir, and Ware River watersheds.¹⁷¹ The Watershed Protection Act provides that "[a]ny alteration, or the Generation, Storage, Disposal or Discharge of Pollutants is prohibited within [certain] portions of the Watershed."¹⁷² The Act further provides a number of definitions for "alteration," including "draining, dumping, dredging, damming, discharging, excavating, filling, or grading" and "the construction or reconstruction or paving of roads and other ways."¹⁷³ In sum, the Watershed Protection Act controls activities and land use within important areas of the Massachusetts watersheds with the intention of protecting drinking water quality.¹⁷⁴ Accordingly, the Act

167. *Id.*

168. Foster & Orwig, *supra* note 148, at 966.

169. *Id.*

170. *Id.* at 967–68.

171. Watershed Protection Act Guidance Document 1, MASS. DEPT. OF CONSERVATION AND RECREATION (Mar. 2006), *available at* <http://www.mass.gov/eea/docs/dcr/watersupply/watershed/wspa-guidance-document.pdf>.

172. 350 MASS. CODE REGS. 11.04(3) (1994).

173. 350 MASS. CODE REGS. 11.03 (1994).

174. Energy and Env'tl. Affairs, *The Watershed Protection Act*, MASS. DEPT. OF CONSERVATION AND RECREATION,

applies only in cities and towns located within the watersheds and only to lands “which are near specific water features in those communities.”¹⁷⁵

The Watershed Protection Act seeks to protect drinking water quality by “establishing two buffer zones around hydrologic resources.”¹⁷⁶ The two buffer zones the Act covers are the Primary Protection Zone and the Secondary Protection Zone.¹⁷⁷ The Primary Protection Zone is the area within 400 feet of a reservoir’s shoreline.¹⁷⁸ The Secondary Protection Zone is the area between 200 and 400 feet from surface waters and tributaries, “on land within flood plains, over some aquifers and within bordering vegetated wetlands.”¹⁷⁹ The Watershed Protection Act prohibits all physical alteration of land in the Primary Protection Zone, while the Secondary Protection Zone allows some physical alteration of land but prohibits any alterations “which pose a high risk of degrading water quality.”¹⁸⁰ Because timber logging both alters the watershed and has the potential to endanger water quality, the Watershed Protection Act suggests that commercial loggers should not be able to harvest trees within the protection zone of the Quabbin.¹⁸¹

The Watershed Protection Act is strictly enforced and has been a source of controversy for Massachusetts land-owners wishing to make changes to their shore front property. In 2000, Massachusetts sued Clealand and Nancy Blair for violations of the Watershed Protection Act because the defendants performed expansion work on their waterfront property on Demond Pond, a water source that flows into the Quabbin.¹⁸² Specifically, the defendants enlarged their lawn; enlarged the shoreline opening of their beach from at least sixty feet to 120 feet; cleared trees from their property’s shorefront area; excavated, filled, and removed twelve inches of topsoil and subsoil from their beach area; placed twelve additional inches of sand on their beach area; placed a retaining wall of seventy-five to eighty-five feet long and at least thirty inches in height on their property, and placed a three-foot-long brick walk through their lawn area.¹⁸³ The court determined the defendants’ modifications to their property constituted “alterations” within

mass.gov/eea/agencies/dcr/water-res-protection/watershed-mgmt/the-watershed-protection-act.html (last visited Aug. 23, 2013).

175. Watershed Protection Act Guidance Document 1, *supra* note 171, at 1.

176. *Id.*

177. *Id.*

178. *Id.* at 3.

179. *Id.*

180. *Id.* at 1.

181. *See* RICE ET AL., *supra* note 25, at 321.

182. *Commonwealth v. Blair*, No. 98-2758-G, at 1 (Mass. Super. Ct. 2000).

183. *Id.* at 2.

the meaning of the Watershed Protection Act.¹⁸⁴ The court explained that the Watershed Protection Act “is a flat prohibition on certain activities and conditions within a certain distance from a watershed.”¹⁸⁵ Because the defendants’ alterations were within 200 feet of the waters’ edge, the court held that they violated the Watershed Protection Act and ordered an injunction requiring them to restore the property to its original condition.¹⁸⁶

This case demonstrates the court’s interpretation that the Watershed Protection Act is a “flat prohibition” on certain activities within a certain distance of a watershed.¹⁸⁷ Therefore, how is it that Massachusetts can allow commercial logging within feet of the surface of the Quabbin Reservoir while it does not allow property owners to alter their property located on a water supply that flows into the Quabbin? The direct answer to this question is that the Watershed Protection Act should prohibit all commercial logging within the specified protection zones of the reservoir.

It is somewhat unclear as to how Massachusetts allowed logging and clear-cutting at the Quabbin in the first place. One theory is this type of logging was only able to take place because the general public was unaware that it was happening.¹⁸⁸ Consequently, once the public became aware of the problem and environmental groups and the media became involved, Governor Patrick responded quickly by placing a moratorium on logging.¹⁸⁹ Indeed, after public outcry on the issue, the state put 185,000 acres and sixty percent of the state’s total public forestland off limits to logging.¹⁹⁰ Furthermore, state forests are currently classified as “parklands, reserves and woodlands,” where commercial logging is restricted or prohibited and clear-cutting more than one third of an acre requires a public approval process.¹⁹¹ In this way, the public attention on this issue certainly made a difference in the way Massachusetts manages its forests. Because Massachusetts was making money from commercial logging through timber sales, another answer to how the clear-cutting has happened is that “the foxes are guarding the watershed henhouse” and turning a blind eye to the logging due to the profit coming out of it.¹⁹² The moratorium is currently still in place; however, it seems as though the state intends to restart the

184. *Id.* at 4.

185. *Id.* at 5.

186. *Id.* at 23.

187. *Id.* at 5.

188. Email from Christopher Matera, Founder of Massachusetts Forest Watch (Nov. 19, 2012, 9:47pm EST) (on file with author).

189. *Will Gov. Patrick Protect the Quabbin Again?*, *supra* note 26.

190. Miner, *supra* note 7, at 1.

191. *Id.*

192. *Id.*

logging program in the future.¹⁹³ An advisory panel has been working on the issue but “almost completely behind closed doors.”¹⁹⁴

CONCLUSION

Massachusetts needs to ban logging at the Quabbin Reservoir permanently in order to safeguard its public drinking water system. The Quabbin is a unique water source that is greatly protected by the forest around it, and harvesting the trees in the forest has a greater risk of harm than benefits. If Massachusetts does not ban commercial logging permanently, it risks both harming its water system and facing dire financial consequences if the court decides to revisit the prior filtration lawsuit in the future. Moreover, logging within the protected zones of the Quabbin is flatly prohibited by the Watershed Protection Act. Therefore, the state needs to permanently ban commercial logging and allow the forest to remain as the first barrier to pollutants.

193. Email from Christopher Matera, *supra* note 188.

194. *Id.*