COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, s.s.

Superior Court Department of the Trial Court Civil Action No.

CONSERVATION LAW FOUNDATION, INC., on behalf of itself and its adversely affected members; BRADLEY CAMPBELL; PETER SHELLEY; SARA MOLYNEAUX; CHRISTOPHER JACKSON; SALLY JACKSON; DAKE HENDERSON; THOMAS KLEIN; TOM BURGESS; ANNA ELIZABETH BURGESS-BERBÉE; RAMONA PETERS; BARBARA MAHONEY; PATRICIA GOVERN, residents of the Commonwealth of Massachusetts,

COMPLAINT

v.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION; the TOWN OF BARNSTABLE, Massachusetts; the TOWN OF MASHPEE, Massachusetts,

Defendants.

Plaintiffs,

The coastal waters of southern Cape Cod are in ecological crisis. Historically, these bays and estuaries had been carpeted with meadows of eelgrass—one of nature's most valuable and productive marine habitats¹—teeming with diverse aquatic life. Today, the meadows have been extirpated, rotting detritus starves the seafloor of sunlight, and algal blooms offer only putrid smells and unsightly scums. For years, officials of the Massachusetts Department of Environmental Protection ("MassDEP") and the Towns of Barnstable and Mashpee (the "Towns"

¹ NOAA, *The importance of eelgrass*, https://www.fisheries.noaa.gov/feature-story/importance-eelgrass; National Park Service, *Eelgrass of Cape Cod National Seashore* (Aug. 2019) *available at* https://irma.nps.gov/Datastore/ DownloadFile/628343 (last visited Jan. 22, 2019).

and with MassDEP, the "Defendants") have understood the predominant cause of this crisis: nitrogen pollution from septic systems. Legally bound to act on this knowledge, Defendants have done less than nothing: they have authorized further pollution.

Plaintiffs bring this civil action enforcing the Massachusetts Environmental Code against Defendants who have unlawfully abdicated their duties to protect the Commonwealth's people and environment. Defendants' unlawful acts and omissions have resulted in severe environmental damage to the coastal waters of southern Cape Cod, namely to the Three Bays Estuary, Popponesset Bay, the Centerville River-East Bay System, and Lewis Bay (collectively the "Southern Cape Coastal Waters").

The Commonwealth's residents and visitors have historically treasured these waterbodies for their natural beauty and thriving aquatic ecosystems. Residents and visitors use these waters for swimming, fishing, birding, boating, and oyster production, among other activities. Today, the ecosystems are not thriving, and decaying algal blooms prevent these waters' human beneficiaries from using them as they had before.

By March 2015, Defendants had officially determined that the use of septic systems within the Southern Cape Coastal Waters' watersheds was causing the ecological crisis. In normal circumstances, a default septic system ("default" in the sense of the most basic systems described in the Massachusetts Environmental Code) filters, and its pollutants are largely removed, as effluent moves through the soils of a septic drain field. This does not occur when default systems are used in Cape Cod's sandy soils. Instead, in the Towns of Barnstable and Mashpee, septic effluent pours through the sand, quickly reaching groundwater, and is washed into the coastal waters carrying a huge load of nitrogen pollution. Urine and fecal matter dissolved into wastewater from default septic systems pollute the Southern Cape Coastal Waters with approximately 373,211 pounds of nitrogen per year.

Upon determining that default septic systems were polluting the Commonwealth's surface waters, Defendants were bound by the law of the Commonwealth to implement and enforce the mandatory legal requirement that these systems be upgraded to end their pollution, as well as to prevent the further installation of failing septic systems. Defendants have failed in this duty. In the past five years, Defendants have not enforced the requirement to upgrade septic systems within the Towns of Barnstable and Mashpee on account of these systems' contribution to the Southern Cape Coastal Waters' nitrogen crisis. On the contrary, Defendants have presided over a proliferation of such systems. Thousands of inspection reports of regulated on-site disposal septic systems have been filed with Defendants. The reports indicate—falsely, and in direct conflict with Defendants' own official determinations-that these septic systems are not discharging nitrogen directly or indirectly into the Southern Cape Coastal Waters. These mandatory inspection reports were all submitted by system inspectors (many of whom are licensed Professional Engineers) trained and licensed by Defendants. Instead of rejecting these inaccurate inspection reports and requiring system upgrades as required by law, even in the last two years Defendants have knowingly authorized and condoned the continued use of thousands of default septic systems. Defendants have done this with the knowledge that these systems will continue to discharge nitrogen-laden septic effluent into the Southern Cape Coastal Waters, accelerating the ecological decline. Furthermore, the Towns of Barnstable and Mashpee have approved hundreds of new and modified default septic systems within this same period—knowingly adding to the crisis.

Plaintiffs respectfully request that the Court enjoin Defendants to submit for the Court's approval a proposed plan by which Defendants will order the upgrade and/or replacement of

default septic systems that pollute the Southern Cape Coastal Waters and exacerbate its ecological crisis. During the pendency of the development and implementation of Defendants' court-supervised plan, Plaintiffs respectfully request the Court to enjoin Defendants from authorizing the installation or modification of, or accepting a passing inspection report for, any default septic system within the drainage of the Southern Cape Coastal Waters.

JURISDICTION AND VENUE

This Court has jurisdiction over this civil action, which is cognizable under the general principles of equity jurisprudence and seeks relief formerly available by writ of mandamus.
 G. L. c. 214, § 1, 7A; G. L. c. 249, § 5.

2. Plaintiffs have fulfilled the relevant notice requirements. G. L. c. 214, § 7A. CLF and the other plaintiffs notified MassDEP, the Towns of Barnstable and Mashpee, and the Massachusetts Attorney General of the environmental damage and natural resource impairment alleged herein by certified mail on September 16, 2020—more than 21 days prior to filing this Complaint. Attached as Exhibit A is a true and correct copy of said notice letter.

3. Venue is appropriate in this Court, as the conduct out of which this action arises occurred within the jurisdiction. G. L. c. 214, § 1; G. L. c. 214, § 7A; G. L. c. 249, § 5.

PARTIES

4. Plaintiff CLF is a Massachusetts not-for-profit corporation with its principal office at 62 Summer Street, Boston, Massachusetts.

5. This action is brought on behalf of the following thirteen Massachusetts-domiciled persons:

- i. CLF;
- Bradley Campbell, a Massachusetts resident with a principal place of business at 62 Summer Street, Boston, MA 02110;

- iii. Peter Shelley, a Massachusetts resident with a principal place of business at62 Summer Street, Boston, MA 02110;
- Sara Molyneaux, a Massachusetts resident with a residence at 581 Old Post Road, Cotuit, MA 02635;
- v. Christopher Jackson, a Massachusetts resident with a residence at 2 Osceola Lane, Billerica, MA 01821;
- vi. Sally Jackson, a Massachusetts resident with a residence at 2 Osceola Lane,Billerica, MA 01821;
- vii. Dake Henderson, a Massachusetts resident with a residence at 10 Fullers Marsh Road, Cotuit, MA 02635;
- viii. Thomas Klein, a Massachusetts resident with a residence at 11 Grove Street,PO Box 386, Cotuit, MA 02635;
- ix. Tom Burgess, a Massachusetts resident with a residence at 658 Main Street, Cotuit, MA 02635;
- Anna Elizabeth Burgess-Berbée, a Massachusetts resident with a residence at 658 Main Street, Cotuit, MA 02635;
- xi. Ramona Peters, a Massachusetts resident with a residence at 320 Great Neck Road, Mashpee, MA 02649;
- xii. Barbara Mahoney, a Massachusetts resident with a residence at 14 Cherry Blossom Way, Milton, MA 02186; and
- xiii. Patricia Govern, a Massachusetts resident with a residence at 438 Regency Drive, Marston Mills, MA 02648.

6. CLF, its adversely affected members, and the identified Massachusetts-domiciled citizens are collectively referred to as "Plaintiffs."

7. CLF as a corporation and on behalf of its adversely affected members has standing to bring this action. CLF's members live near and adjacent to the Southern Cape Coastal Waters. They use and enjoy these waters for activities such as swimming, fishing, birding, boating, and oyster production, among other uses.

8. Injuries suffered by CLF's members due to the Defendants' acts and omissions are different in kind and degree than injuries suffered by the general public.

9. By virtue of their Massachusetts residence, and pursuant to the public rights doctrine, Plaintiffs also have standing to enforce through mandamus the public duties owed to them and the public by the Commissioner and the Towns.

10. The identified Massachusetts-domiciled persons have standing to seek declaratory and injunctive relief to abate damage to the environment that is occurring and will continue to occur as a result of the Defendants' failures to comply with the laws of the Commonwealth. G. L. c. 214, § 7A.

11. The public health and safety and environmental interests of CLF, its adversely affected members, and the identified Massachusetts-domiciled persons are within the primary purposes and the zone of interests of the on-site sewage disposal program set forth in Title 5 of the Massachusetts Environmental Code, 310 Code Mass. Regs. §§ 15.001 ("Title 5").

12. Defendant MassDEP is an agency of the Commonwealth of Massachusetts, mandated by statute with the adoption and enforcement of the Massachusetts Environmental Code, with headquarters located at 1 Winter Street, Boston, MA 02108.

13. Defendant Town of Barnstable is a municipality within the Commonwealth of Massachusetts, with a town hall located at 367 Main Street, Hyannis, MA 02601.

14. Defendant Town of Mashpee is a municipality within the Commonwealth of Massachusetts, with a town hall located at 16 Great Neck Road North, Mashpee, MA 02649.

LEGAL BACKGROUND

I. MassDEP's and Municipalities' Authority under Title 5 of the Massachusetts Environmental Code

15. Massachusetts General Laws, Chapter 21A, Section 13 mandates that the Commissioner of MassDEP "adopt, and from time to time amend, regulations to be known as the state environmental code" including "standards for the disposal of sewage."

16. Pursuant to its statutory mandate, MassDEP has promulgated regulations "to provide for the protection of public health, safety, welfare and the environment by requiring the proper siting, construction, upgrade, and maintenance of on-site sewage disposal systems and appropriate means for the transport and disposal of septage." 310 Code Mass. Regs. § 15.001(a).

17. These regulations are codified in Title 5.

18. Title 5 sets requirements applicable to all on-site septic systems in the Commonwealth. 310 Code Mass. Regs. \S 15.004.²

19. MassDEP delegates primary responsibility for implementing and enforcing the provisions of Title 5 for most septic systems to the local municipality's board of health as the "Local Approving Authority." *See* 310 Code Mass. Regs. §§ 15.025, 15.003(2); *id.* § 15.002.

² These are systems treating sewage generated on the same property that are designed to treat less than ten thousand gallons per day, although an owner/operator can seek a variance from MassDEP to construct or upgrade a system to accommodate a greater flow rate. *See* 310 Code Mass. Regs. § 15.006(3) ("There shall be no increased flow to an existing system which results in a design flow of 10,000 gpd or greater except in accordance with a variance issued by the Department pursuant to 310 CMR 15.414").

20. Title 5 places affirmative legal duties on local boards of health to enforce its requirements, "with oversight and assistance by the Department as necessary or as set forth in 310 CMR 15.000." 310 Code Mass. Regs. § 15.025.

21. Title 5 instructs that local boards of health "may enact more stringent regulations to protect public health, safety, welfare" if they are adopted in accordance with administrative procedures for adopting health regulations. 310 Code Mass. Regs. § 15.003(3).

22. Local boards of health must enforce the provisions of Title 5, "but, if any such local boards fail after the lapse of a reasonable length of time to enforce the same, [MassDEP] may in like manner enforce said code against any violator." G. L. c. 21A § 13; 310 Code Mass. Regs. § 15.025(5).

II. Defendants' Roles in Regulating Septic Systems

23. Title 5 defines certain circumstances that qualify as *per se* violations of the Code. *See* 310 Code Mass. Regs. § 15.024.

24. One *per se* violation occurs where the operation of a septic system results in "discharge of effluent directly or indirectly to . . . a surface water of the Commonwealth." 310 Code Mass. Regs. § 15.024(8).

25. Effluent refers to "[s]anitary sewage discharged into the environment, whether or not treated." 310 Code Mass. Regs. § 15.002.

26. A "surface water" refers to "[a]ll waters other than groundwaters within the jurisdiction of the Commonwealth, including without limitation, rivers, streams, lakes, ponds, springs, reservoirs, impoundments, estuaries, wetlands, coastal waters and certified vernal pools." 310 Code Mass. Regs. § 15.002.

27. Title 5 defines at least two ways in which the MassDEP and local boards of health evaluate operation of a particular septic system: (i) approval of new or modified systems, and (ii) periodic inspection of systems.

28. Before constructing or modifying a system, the owner or operator of the system must obtain a permit, called a "Disposal System Construction Permit" from the local board of health or, in the case of a large system (with a design flow of ten thousand gallons per day or more), from MassDEP. *See* 310 Code Mass. Regs. § 15.020(1).

29. Once construction or modification is complete, but before the owner or operator can discharge sewage into it, the owner must obtain a "Certificate of Compliance" from the local board of health or, in the case of a large system (with a design flow of ten thousand gallons per day or more), from MassDEP. *See* 310 Code Mass. Regs. § 15.021.

30. The local board of health or MassDEP may only issue a "Certificate of Compliance" if it determines that the system satisfies all requirements of Title 5. *See id.* § 15.021(4).

31. Further, the local board of health and MassDEP also oversee the inspection of existing septic systems.

32. With some limited exceptions, inspections must occur "at or within two years prior to the time of transfer of title to the facility served by the system." 310 Code Mass. Regs. § 15.301.

33. MassDEP approves all "System Inspectors" to assure their fitness and qualifications: "Individuals who qualify pursuant to 310 CMR 15.340(1) shall apply to the Department, or an agent authorized by the Department, for approval to perform inspections required under 310 CMR 15.000. Such application shall demonstrate satisfactorily to the

Department, or an agent authorized by the Department, the qualifications of the applicant and shall be accompanied by a fee as established by the Department." 310 Code Mass. Regs. § 15.340(2).

34. MassDEP's approval assures that System Inspectors meet requirements of competence to complete inspections, issue accurate inspection reports and opinions, and certify inspection reports submitted to MassDEP and the local boards of health.

35. According to MassDEP's regulations, "[i]t shall be a violation of 310 CMR 15.000 for any person to falsify, misrepresent or fraudulently alter a system inspection report or the results of an inspection." *Id.* § 15.340(9).

36. MassDEP may revoke or suspend the approval of a System Inspector for, among other reasons "conduct[ing] a system inspection which does not comply with 310 CMR 15.000 and has incorrectly passed or failed the system." *Id.* § 15.340(9).

37. As a mandatory condition of renewing an approval application, System Inspectors must demonstrate to MassDEP that they have "earned ten Training Contact Hours in the previous three years" to assure that the System Inspector can "safely and accurately" conduct inspections and assess the condition and function of systems. *Id.* § 15.340(13).

38. System Inspectors may only be approved by MassDEP if they "attend training provided or authorized by the Department." *Id.* § 15.340(4).

39. MassDEP has complete control over the substance of training subject matter and materials.

40. The Barnstable Board of Health, an arm of the Town of Barnstable, is the Local Approving Authority for the Town of Barnstable.

41. The Mashpee Board of Health, an arm of the Town of Mashpee, is the Local Approving Authority for the Town of Mashpee.

42. MassDEP serves as the Approving Authority for all large systems in the Towns of Barnstable and Mashpee, meaning those with a design flow of ten thousand gallons per day or greater. 310 Code Mass. Regs. § 15.002.

43. In the Town of Barnstable, inspections must be performed by a System Inspector approved by MassDEP and who is "registered as a septic system inspector with the Town of Barnstable Board of Health." 310 Code Mass. Regs. § 15.340; Town of Barnstable Code § 360-33.

44. During a system inspection, the inspector analyzes whether the septic system displays any of the "failure criteria" identified in Title 5. *See* 310 Code Mass. Regs. § 15.302(2)(c); 310 Code Mass. Regs. § 15.303.

45. As Local Approving Authority for the Town of Mashpee, the Mashpee Board of Health receives septic system inspection reports.³

46. The Mashpee Board of Health retains a list of licensed inspectors that it affirmatively provides to system owners who seek an inspection of their septic system.⁴

47. Further, under Town of Mashpee bylaws, "[p]rior to the issuance of a disposal works construction permit by the Board of Health for the installation of a sewage disposal system, an independent registered civil or sanitary engineer may be retained by the Board of Health to conduct a review of the planned sewage disposal system and related hydrologic data regarding the impact of the proposed discharge on ground and surface waters." Mashpee Gen. Bylaws § 106-5.

³ See, e.g., Town of Mashpee, How Do I Obtain A Copy of My Septic System Inspection Report, https://

www.mashpeema.gov/board-health/faq/how-do-i-obtain-copy-my-septic-system-inspection-report (last visited June 9, 2021).

⁴ See id.

48. As noted above, one of the listed failure criteria for a system inspection is that "there is a discharge of effluent directly or indirectly . . . to a surface water of the Commonwealth." 310 Code Mass. Regs. § 15.303(1)(a)(2).

49. The results of all system inspections are submitted to the local board of health within 30 days of the inspection, unless the system has a potential design flow of ten thousand gallons per day or more, in which case the inspection results are submitted to MassDEP. *See* 310 Code Mass. Regs. § 15.301(10).

50. If the local board of health or MassDEP determines that a septic system is failing to protect public health and safety and the environment, the system "shall be upgraded." 310 Code Mass. Regs. § 15.303(1).

51. MassDEP and/or the local board of health must order the upgrade of a system if one or both determine that a "specific circumstance exists by which any system threatens public health, safety, welfare or the environment, causes or threatens to cause damage to property or creates a nuisance." 310 Code Mass. Regs. § 15.303(2); *id.* § 15.304(4) (large systems).

52. The duty to upgrade falls upon the owner/operator of the failing system. *See* 310 Code Mass. Regs. § 15.305(1).

53. The owner/operator of a failing system must upgrade the system within two years. *See* 310 Code Mass. Regs. § 15.305(1).

54. Pending the upgrade, the owner/operator of a failing system must "take appropriate measures . . . to ensure that there is no backup or direct discharge of sewage or effluent . . . to surface waters." 310 Code Mass. Regs. § 15.305(2).

55. When an upgrade is required, Title 5 provides two options to owners/operators. First, they may install an "alternative system," a septic system with added or different elements

approved by MassDEP to resolve the cause of the failure. *See* 310 Code Mass. Regs. § 15.282(4). Second, they may install a "tight tank," a watertight vessel with no outlet to release effluent. *See* 310 Code Mass. Regs. § 15.002.

FACTUAL BACKGROUND

I. The Waterbodies

56. The Towns of Barnstable and Mashpee are located in Barnstable County on Cape Cod, with Cape Cod Bay to the north and Nantucket Sound to the south.

57. The Towns of Barnstable and Mashpee occupy what is termed a "sandy glacial outwash aquifer," a land formation of sandy permeable soil formed by the outwash of the Laurentide Ice Sheet as it retreated twenty thousand years ago.⁵

58. Waters on the southern part of the Towns of Barnstable and Mashpee flow via ground and surface waters into a system of estuaries and bays in which the aquifer's freshwaters mix with saltwater from Nantucket Sound.

59. These estuaries and bays include the Southern Cape Coastal Waters: Three Bays Estuary, Popponesset Bay, the Centerville River-East Bay System, and Lewis Bay.

60. Historically, the Southern Cape Coastal Waters were rich ecosystems, boasting a rich diversity of aquatic flora and fauna.

61. Meadows of eelgrass were the basis of a highly productive marine food web.

62. Eelgrass is a flowering aquatic plant that roots into the seafloor and grows in thick meadows, providing critical habitats for macroinvertebrates and fish.⁶

⁵ See, e.g., MEP, Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for Popponesset Bay, Mashpee and Barnstable, Massachusetts 9 (Sept. 2004) ("MEP Popponesset Bay Report"); USGS, Glacial Cape Cod, https://pubs.usgs.gov/gip/capecod/glacial.html.

⁶ See MassDEP, Three Bays System Total Maximum Daily Loads for Total Nitrogen ii (Sept. 7, 2007) ("Three Bays TMDL").

63. Eelgrass meadows provide foraging areas and shelter to young fish and invertebrates.

64. Waterfowl and aquatic species use eelgrass for food and for spawning surfaces.

65. Eelgrass roots into the seafloor, trapping sediment, stabilizing the substrate, and reducing the force of wave energy, thereby reducing coastal erosion.

66. Eelgrass meadows can improve water quality by filtering polluted water, while generating oxygen and sequestering carbon dioxide.

67. Aside from their ecological importance, the Southern Cape Coastal Waters are important to the Cape's human residents and visitors. Massachusetts residents and visitors have treasured the Southern Cape Coastal Waters for their natural beauty, ecological richness, and as the setting for activities such as swimming, fishing, oyster production, boating, and birding.

II. The Southern Cape Coastal Waters' Nitrogen Crisis

68. In the past two decades, however, nitrogen pollution has threatened the Southern Cape Coastal Waters' ecological integrity and their continued use by Massachusetts residents.

69. In coastal waters, nitrogen is a limiting nutrient for algal populations. This means that algal populations increase in direct proportion to available supplies of nitrogen.

70. In a process known as "eutrophication," when levels of nitrogen increase, algae and aquatic plant concentrations reach densities that overwhelm natural ecosystem functions.

71. In waters experiencing eutrophication, plants and algae generate "blooms," meaning they experience explosive population growth.

72. Eutrophic blooms have severe crowding-out effects on the native aquatic ecosystem, and estuary systems are particularly sensitive to such effects.

73. Blooms result in large quantities of rotting organic matter in the waterbody.

74. The resulting processes of decay exhaust available supplies of dissolved oxygen in the water and render the water so turbid that sunlight cannot reach the seafloor.

75. Fish and shellfish die from the deprivation of dissolved oxygen.

76. The Southern Cape Coastal Waters are experiencing eutrophication.

77. In the Three Bays Estuary, Centerville River-East Bay System, and Popponesset Bay, nitrogen pollution has resulted in algal blooms followed by extreme decreases in dissolved oxygen concentrations that threaten aquatic life and reduced species diversity,⁷ including through periodic fish kills.⁸

78. In the waters around Massachusetts, nitrogen pollution has caused widespread losses in eelgrass.⁹ In Lewis Bay, nitrogen pollution has rendered eelgrass virtually non-existent.¹⁰ In the Three Bays Estuary, Centerville River-East Bay System, and Popponesset Bay, nitrogen pollution has eliminated eelgrass meadows.¹¹

79. In the Southern Cape Coastal Waters, nitrogen pollution has resulted in the near loss of the benthic community, according to MassDEP.¹²

80. High nitrogen levels also cause red tides, phenomena that occur when toxinproducing algae grow in out-of-control amounts.

⁷ See Three Bays TMDL at ii; MassDEP, Popponesset Bay Total Maximum Daily Loads for Total Nitrogen i (Apr. 10, 2006) ("Popponesset Bay TMDL").

⁸ See Three Bays TMDL at 7.

⁹ See Charles T. Costello & William Judson Kenworthy, *Twelve-Year Mapping and Change Analysis of Eelgrass* (Zostera marina) Areal Abundance in Massachusetts (USA) Identifies Statewide Declines, 34 Estuaries and Coasts 232-33 (2011), *available at* https://www.mass.gov/doc/twelve-year-mapping-change-analysis-of-eelgrass-zostera-marina-areal-abundance-in-massachusetts/download (last visited Jan. 22, 2019).

¹⁰ See MassDEP, Lewis Bay System and Halls Creek Total Maximum Daily Loads For Total Nitrogen 5 (Mar. 3, 2015) ("Lewis Bay TMDL").

¹¹ See Three Bays TMDL at ii; Three Bays TMDL at 7; Popponesset Bay TMDL at i, 3, 6, 8; Centerville TMDL at 5 ("Eelgrass beds, which are critical habitat for macroinvertebrates and fish, have completely disappeared from these waters").

¹² See Popponesset Bay TMDL at 4-5; Lewis Bay TMDL at 5; Three Bays TMDL at 7; MassDEP, Centerville River- East Bay System Total Maximum Daily Loads for Total Nitrogen 5 (Jan. 29, 2008) ("Centerville TMDL").

81. Algal blooms and red tides are harmful to both animal and human water-users, frequently causing fish kills and beach closures.

82. Eutrophic waterbodies, with algal blooms and red tides, are aesthetically unappealing.

83. Water clarity is reduced in such waterbodies.

84. In eutrophic waters, algae appear on the surface of the water as a green, green-blue, brown or red film.

85. In eutrophic waters, algal growth and decay also lead to unpleasant odors.

86. The Three Bays Estuary, Lewis Bay, and Popponesset Bay experience such unpleasant odors and scums from algae blooms.¹³

III. Septic Effluent Pollution of the Southern Cape Coastal Waters

87. The primary cause of eutrophication in the Southern Cape Coastal Waters is nitrogen pollution by septic-system effluent.

88. A septic system is a technology for partially treating and disposing of human wastes.

89. In a default on-site septic system under Title 5,¹⁴ raw wastewater is directed to a buried tank in which solids settle and clarified (i.e. partially treated) wastewater—at this point termed "effluent"—is directed by means of a distribution box and a network of pipes to a subsurface Soil Absorption System.

¹³ See Three Bays TMDL at 7; Popponesset Bay TMDL at 4-5; Lewis Bay TMDL at 5.

¹⁴ As compared to "tight tanks, shared systems and alternative systems." *See* 310 Code Mass. Regs. § 15.002 (defining On-site System or Disposal System or On-Site Subsurface Sewage Disposal System or System").

90. A Soil Absorption System typically consists of unsaturated soil that accepts, filters, and disperses effluent as it percolates through the soil so that pollutants are removed from effluent before the wastewater reaches groundwater.

91. During the effluent's percolation through soil, the Soil Absorption System is intended to assure that pollutants are absorbed and/or consumed by organisms in the soil.

92. For a Soil Absorption System to meet this objective, at least two conditions are necessary. First, effluent must remain in soil for a sufficient time before reaching groundwater. Second, soil must be suited to the removal of pollutants from septic effluent.

93. Soil composition determines how quickly effluent percolates through the Soil Absorption System. It also determines which and to what degree pollutants are removed from effluent before it reaches groundwater.

94. The soils of Cape Cod, including in the Towns of Barnstable and Mashpee, consist predominantly of sand and gravel.¹⁵

95. Water moves rapidly through this type of soil.¹⁶

96. In the soils of Cape Cod, little to no nitrogen is attenuated from the effluent before it reaches groundwater.

97. No nitrogen is attenuated once the effluent reaches groundwater.

98. In the soils of Cape Cod, wastewater effluent (from septic systems and from wastewater treatment facilities) discharge to the ground enters the groundwater system and eventually enters the surface water bodies.¹⁷

¹⁵ See Lewis Bay TMDL at 17.

¹⁶ See id.

¹⁷ See Lewis Bay TMDL at 4; Popponesset TMDL at 4; Three Bays TMDL at 5; Centerville River TMDL at 4.

99. In the sandy soils of Cape Cod, effluent that has entered the groundwater travels towards coastal waters at an average rate of one foot per day.¹⁸

100. The nutrient load to the groundwater system is directly related to the number of subsurface wastewater disposal systems, which in turn is related to the population.¹⁹

101. Cape Cod has a high groundwater table associated with an upwelling, highly oxygenated aquifer.

102. On Cape Cod, surface and groundwater flows are pathways for the transfer of landsourced nutrients to coastal waters.²⁰

103. Nitrogen, primarily as plant available nitrate, is readily transported through oxygenated groundwater systems on Cape Cod.²¹

104. The Cape's aquifer has been very accurately characterized through decades of scientific study.

105. In 1993, the United States Department of Agriculture conducted a soil survey in Barnstable County.

106. According to the Department of Agriculture, soil types in Barnstable County were "so unfavorable or so difficult to overcome" for the use of septic tank absorption fields, "that special design, significant increases in construction costs, and possibly increased maintenance [we]re required."²²

¹⁸ See Lewis Bay TMDL at 4; Popponesset TMDL at 4; Three Bays TMDL at 5; Centerville River TMDL at 4.

¹⁹ See Lewis Bay TMDL at 4; Popponesset TMDL at 4; Three Bays TMDL at 5; Centerville River TMDL at 4.

²⁰ See MEP Popponesset Bay Report at 9.

²¹ See id.

²² U.S. Dept. of Agric., *Soil Survey of Barnstable County, Massachusetts* 86, 171 tbl. 11 (Mar. 1993) ("Soil Survey").

107. The Department of Agriculture study concluded that, due to the unsuitability of its sandy soils, use of septic systems in Barnstable County could result in polluted effluent passing through the soil without filtration, resulting in the pollution of groundwater.²³

108. Due to the nature of the soils in Barnstable County, any and all default septic systems used in such soils discharge effluent including nitrogen directly or indirectly to surface waters of the Commonwealth.

IV. MassDEP Determines Septic Systems in Barnstable and Mashpee Pollute the Southern Cape Coastal Waters.

109. Fifteen years after the Department of Agriculture's findings, MassDEP determined that nitrogen pollution by septic effluent had already detrimentally changed—and was continuing to change—the Southern Cape Coastal Waters to the point that Massachusetts Water Quality Standards were violated.

110. These determinations were officially adopted through MassDEP's issuance of "total maximum daily load" allocations ("TMDLs") of nitrogen for the Southern Cape Coastal Waters as required by the Federal Clean Water Act (33 U.S.C. § 1311(d)).

111. Under Section 303(d) of the Federal Clean Water Act, the Commonwealth is required to identify waters for which effluent limitations normally required are not stringent enough to attain water quality standards and to establish TMDLs for such waters for the pollutants of concern.²⁴

112. The TMDLs establish the maximum loadings of pollutants of concern, from all contributing sources, that a water body may receive and still meet and maintain its water quality standards and designated uses.

²³ See id. at 20.

²⁴ See, e.g., Centerville TMDL at 1.

113. In setting a TMDL for a body of water, the Commonwealth must determine present water quality conditions in the water body and determine whether the water body is presently meeting its water quality standards and designated uses, and if not the sources of the pollutants of concern.²⁵

114. Where a TMDL is necessary, the Commonwealth must submit a proposed TMDL to the Environmental Protection Agency ("EPA") for the federal agency's approval.

115. After EPA's approval, the TMDL serves as a guide for future implementation activities.

a. MassDEP's Determination Regarding Septic Systems in Popponesset Bay

116. Nitrogen pollution has caused degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources in the Popponesset Bay watershed.²⁶

117. In April 2006, MassDEP submitted a final TMDL on Popponesset Bay to EPA.

118. The pollutant of concern for this TMDL was nitrogen.²⁷

119. According to MassDEP's report, Popponesset Bay was eutrophic, and "at risk of further eutrophication from high nutrient loads in the groundwater and runoff from [its] watershed[]."²⁸

120. MassDEP's report attributed the effects of eutrophication—algal blooms, depleted oxygen, elimination of eelgrass meadows, crashes in biodiversity—to nitrogen pollution within the drainage.²⁹

²⁵ See id. at 1.

²⁶ See Popponesset Bay TMDL at 3.

²⁷ See id. at 1.

²⁸ *Id.* at 2.

²⁹ See id. at 1.

121. MassDEP observed that "Watershed N[itrogen] loads . . . to the Popponesset Bay System from the Towns of Mashpee and Barnstable were comprised primarily of septic system N[itrogen] loading."³⁰

122. According to MassDEP, nitrogen pollution had caused "degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources" in Popponesset Bay.³¹

123. According to MassDEP's report, the largest controllable source polluting Popponesset Bay with nitrogen was effluent from default septic systems.³²

124. The Popponesset Bay watershed is eutrophic and is "at risk of further degradation from increased N[itrogen] loads."³³

125. MassDEP's analysis incorporated the data and analysis of a 2004 technical report on the Popponesset Bay by the Massachusetts Estuaries Project ("MEP").³⁴

126. The Massachusetts Estuaries Project is a collaborative effort between local and federal governmental entities, and non-profit and academic institutions, including MassDEP, the University of Massachusetts, the United States Geological Survey, and the Cape Cod Commission, with support from, among others, the Towns of Barnstable and Mashpee. The Project was formed to conduct studies of waterbodies in the Commonwealth to "help determine current nitrogen loads to southeastern Massachusetts estuaries and evaluate reductions that would be necessary to support healthy ecosystems."³⁵

³⁵ MEP, *The Massachusetts Estuaries Project and Reports*, https://www.mass.gov/guides/the-massachusetts-estuaries-project-and-reports#-the-project- (last visited Jan. 17, 2019).

³⁰ *Id.* at 12.

³¹ *Id.* at 3.

³² See id. at 13.

³³ *Id.* at 2.

³⁴ See *id.* at 1 ("The TMDLs for total N for the five coastal sub-embayments within the Popponesset Bay System are based primarily on data collected, compiled, and analyzed by University of Massachusetts Dartmouth's School of Marine Science and Technology (SMAST), the Towns of Mashpee and Barnstable, the Cape Cod Commission, and others, as part of the Massachusetts Estuaries Program (MEP).").

127. The "core" of the Massachusetts Estuaries Project technical report on Popponesset Bay is its "Linked Watershed-Embayment Management" model.³⁶

128. The Massachusetts Estuaries Project used this model to combine data on sources of nitrogen input with data on "embayment circulation and nitrogen characteristics" in order to "spatially distribute[] the watershed nitrogen loading to the embayment" and provide quantitative determinations of the embayment's nitrogen sensitivity, and responses to changes in loading rates.³⁷

129. The Massachusetts Estuaries Project calibrated and validated the model's results by checking them against data collected in the field.³⁸

130. Massachusetts Estuaries Project staff obtained data for the over 8,200 parcels³⁹ within the Popponesset Bay watershed from the Towns of Barnstable, Sandwich, and Mashpee, categorizing land parcel-by-parcel.⁴⁰

131. The Project found that "97% of the parcels use on-site septic systems," with "[o]nly
3% of the parcels within the watershed [] connected [to] one of the four wastewater treatment facilities."⁴¹

132. The Project obtained parcel water use information from the relevant water districts, allowing for an estimate of wastewater volume for on-site systems.⁴²

³⁶ *Id.* at 8.

³⁷ *Id.* at 5-6.

³⁸ See *id.* at 6.

³⁹ See id. at 28.

⁴⁰ See *id.* at 24.

⁴¹ *Id.* at 28.

⁴² See *id.* at 28.

133. The Project concluded that "[a]ll wastewater is returned to the aquifer within the Popponesset Bay watershed either through individual on-site septic systems or the four [wastewater treatment facilities]."⁴³

134. For parcels that use private wells—for which publicly available water use data was not available—Project staff extrapolated water use from similar parcels in the watershed.⁴⁴

135. Using these figures, and the wastewater-engineering convention that 90 percent of water is converted to wastewater, Project staff calculated a total wastewater volume within the drainage.⁴⁵

136. Project staff then applied an average wastewater nitrogen concentration to this volume—35 mg/L—and accounted for the attenuation of nitrogen both within the septic tank and soil—25 percent⁴⁶—concluding there was a total load of 32,300 kilograms of nitrogen added to the Popponesset Bay watershed's surface waters from wastewater each year.⁴⁷

137. The Massachusetts Estuaries Project's Popponesset Bay report uses data or extrapolation for every parcel in the drainage with a default septic system: its understanding was that every on-site septic system in the watershed contributes nitrogen that reaches Popponesset Bay. At no point does the Report qualify this determination.

138. In other words, at the "core" of the Massachusetts Estuaries Project Report on Popponesset Bay is the understanding that every default septic system within the drainage is polluting the Southern Cape Coastal Waters with nitrogen.

⁴³ *Id.* at 26.

⁴⁴ See id. at 28.

⁴⁵ See id. at 28.

⁴⁶ See *id*. at 28.

⁴⁷ See id. at 34, tbl. IV-5.

139. MassDEP expressed a "high degree of certainty in the final result" of this analysis of the watershed's hydrodynamics and water quality.⁴⁸

140. MassDEP has not modified this statement of confidence in the Massachusetts Estuaries Project's model or the conclusions.

141. MassDEP attached the Massachusetts Estuaries Project's report on Popponesset Bay to its TMDL as part of the Commonwealth's TMDL submission to EPA.

142. The Popponesset Bay TMDL states that nitrogen concentrations in the Popponesset Bay watershed would have to be reduced to 0.38 mg/L to attain Massachusetts Surface Water Quality Standards.

143. The Popponesset Bay TMDL defines the following septic load reductions by subembayment that are necessary to achieve the watershed's TMDL⁴⁹:

i. In the Popponesset Creek sub-embayment, from 4 kg/day to 0 kg/day;

ii. In the Ockway Bay sub-embayment, from 2.39 kg/day to 0 kg/day;

iii. In the Mashpee River sub-embayment, from 9.61 kg/day to 0 kg/day; and

iv. In the Shoestring Bay sub-embayment, from 6.94 kg/day to 0 kg/day.

144. In January 2008, EPA approved MassDEP's Popponesset Bay TMDL determination—including its incorporation of the Massachusetts Estuaries Project finding regarding all septic systems within the Popponesset Bay drainage.

145. Since EPA's approval of the Popponesset Bay TMDL in 2008, no meaningful nitrogen reduction has been achieved in the Barnstable section of the Popponesset Bay watershed.

⁴⁸ Popponesset Bay TMDL at 18-19.

⁴⁹ *Id.* at 25 tbl. B-1.

146. Since EPA's approval of the Popponesset Bay TMDL in 2008, no meaningful nitrogen reduction has been achieved in the Mashpee section of the Popponesset Bay watershed.

147. The nitrogen reductions specified for Popponesset Bay sub-embayments in the TMDL have not been met.

148. Unless the nitrogen pollution originating from default septic systems is reduced to levels set in the TMDL (with further reductions established for other controllable sources of nitrogen) or the pollution is otherwise offset, the Popponesset Bay watershed will deteriorate ecologically even further.

b. MassDEP's Determination Regarding Septic Systems in the Three Bays Estuary Watershed

149. The Three Bays Estuary watershed is eutrophic and is "at risk of further degradation from increased N[itrogen] loads."⁵⁰

150. Nitrogen pollution has caused "degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources" in the Three Bays Estuary watershed.⁵¹

151. In April 2007, MassDEP submitted a final TMDL report on the Three Bays Estuary to EPA.

152. The pollutant of concern for this TMDL was nitrogen.⁵²

153. According to MassDEP's report, the Three Bays Estuary is eutrophic, and is "at risk of further degradation from increased N[itrogen] loads."⁵³

⁵⁰ Three Bays TMDL at 2-3.

⁵¹ *Id.* at 3.

⁵² See id. at 1.

⁵³ *Id.* at 2-3.

154. MassDEP's TMDL attributed the effects of eutrophication—algal blooms, depleted oxygen, elimination of eelgrass meadows, crashes in biodiversity—to nitrogen pollution within the drainage.⁵⁴

155. According to MassDEP, nitrogen pollution has caused "degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources" in the Three Bays Estuary.⁵⁵

156. According to MassDEP, the largest controllable source polluting the Three Bays Estuary with nitrogen was effluent from default septic systems.⁵⁶

157. MassDEP's TMDL analysis incorporates the data and analysis of a 2006 technical report on the Three Bays Estuary by the Massachusetts Estuaries Project.⁵⁷

158. As with its Popponesset Bay report, the "core" of the Project's technical report on the Three Bays Estuary was its "Linked Watershed-Embayment Management" model,⁵⁸ the results of which were calibrated and validated against data collected in the field.⁵⁹

159. Project staff obtained data for the 9,153 parcels within the Three Bays Estuary watershed, categorizing land parcel-by-parcel.⁶⁰

160. They obtained parcel water use information from the relevant water districts, allowing for an estimate of wastewater volume for on-site systems.⁶¹

⁵⁴ See id. at 1.

⁵⁵ *Id.* at 3.

⁵⁶ See id. at 8 ("Septic system sources of nitrogen are the largest controllable sources").

⁵⁷ See id. at 1; MEP, Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for Three Bays, Barnstable, Massachusetts 5 (Apr. 2006) ("MEP Three Bays Report").

⁵⁸ MEP Three Bays Report at 6.

⁵⁹ See id. at 7.

⁶⁰ See id. at 29, 33.

⁶¹ See id. at 29.

161. For parcels that use private wells—for which publicly available water use data was not available—Project staff extrapolated water use from similar parcels in the watershed.⁶²

162. Using the same method as in the Popponesset Bay Report, Project staff calculated that the Three Bays Estuary received a total load of 53,584 kilograms of nitrogen from wastewater each year.⁶³

163. The Project's Three Bays Estuary report uses water use data or extrapolation for every parcel in the drainage with an onsite septic system, with the understanding that every default septic system in the watershed contributes nitrogen that pollutes the Three Bays Estuary. At no point does the Report qualify this determination.

164. MassDEP expressed a "high degree of certainty in the final result" of this analysis of the watershed's hydrodynamics and water quality.⁶⁴

165. MassDEP has not modified its statement of confidence in the Massachusetts Estuaries Project's model or conclusions.

166. The Three Bays TMDL states that nitrogen concentrations in the Three Bays Estuary watershed would have to be reduced to within the range from 0.38 to 0.50 mg/L to attain Massachusetts Surface Water Quality Standards.⁶⁵

167. The Three Bays TMDL defines the following septic load reductions by subembayment which are "necessary" to achieve the watershed's TMDL⁶⁶:

- i. In the Cotuit Bay sub-embayment, from 17.022 kg/day to 13.618 kg/day;
- ii. In the West Bay sub-embayment, from 15.49 kg/day to 12.392 kg/day;

⁶² See id. at 34.

⁶³ See id. at 39, tbl. IV-5.

⁶⁴ Three Bays TMDL at 19-20.

⁶⁵ See id. at iii.

⁶⁶ See id. at 26 tbl. VIII-2.

- iii. In the North Bay sub-embayment, from 24.978 kg/day to 0 kg/day;
- iv. In the Prince Cove sub-embayment, from 11.192 kg/day to 0 kg/day;
- v. In the Warrens Cove, sub-embayment, from 6.975 kg/day to 0 kg/day;
- vi. In the Prince Cove Channel sub-embayment, from 4.767 kg/day to 0 kg/ day; and
- vii. In Marstons Mills Crescent sub-embayment, from 3.573 kg/day to 0 kg/day.

168. MassDEP attached the Project's Three Bays Estuary Report to its TMDL submission to EPA.⁶⁷

169. In February 2008, EPA approved MassDEP's Three Bays TMDL determination including its incorporation of the Project's finding regarding all septic systems within the Three Bays Estuary drainage.

170. Since EPA's approval of the TMDL, no meaningful nitrogen reduction has been achieved in the Three Bays Estuary watershed.

171. The nitrogen reductions specified for the Three Bays Estuary watershed in the TMDL have not been met.

172. Unless the nitrogen pollution originating from default septic systems is reduced to levels set in the TMDL (with further reductions established for other controllable sources of nitrogen) or the pollution is otherwise offset, the Three Bays Estuary watershed will deteriorate ecologically even further.

c. MassDEP's Determination Regarding Septic Systems in the Centerville River Watershed

⁶⁷ See id. at 1.

173. The Centerville River watershed is eutrophic and is "at risk of further degradation from increased N[itrogen] loads."⁶⁸

174. Nitrogen pollution has caused "degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources" in the Centerville River watershed.⁶⁹

175. In January 2008, MassDEP submitted a final TMDL report on the Centerville River–East Bay System to EPA.

176. The pollutant of concern for this TMDL was nitrogen.⁷⁰

177. MassDEP's report attributes the effects of eutrophication—algal blooms, depleted oxygen, elimination of eelgrass meadows, crashes in biodiversity—to nitrogen pollution within the drainage.⁷¹

178. According to MassDEP, nitrogen pollution has caused "degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources" in the Centerville River–East Bay System.⁷²

179. According to MassDEP's report, the largest controllable source polluting the Centerville River–East Bay System with nitrogen was effluent from septic systems.⁷³

180. MassDEP's TMDL incorporates the data and analysis of a 2006 technical report on the Centerville River–East Bay System by the Massachusetts Estuaries Project.⁷⁴

181. As with its Popponesset Bay and Three Bays Estuary reports, the "core" of the Project's technical report on the Centerville River–East Bay System was its "Linked Watershed-

⁶⁸ Centerville TMDL at 2.

⁶⁹ *Id.* at 3.

⁷⁰ See id. at 1.

⁷¹ See id. at 1.

⁷² *Id.* at 3.

⁷³ See id. at 7 ("Septic system sources of nitrogen are the largest controllable sources").

⁷⁴ See id. at 2.

Embayment Management" model, the results of which were calibrated and validated against data collected in the field.⁷⁵

182. Project staff obtained data for the 6,936 parcels within the watershed from the Town of Barnstable, categorizing land parcel-by-parcel.⁷⁶

183. They obtained parcel water use information from the relevant Water Districts, allowing for an estimate of wastewater volume for on-site systems.⁷⁷

184. For parcels that use private wells—for which publicly available water use data was not available—Project staff extrapolated water use from similar parcels in the watershed.⁷⁸

185. Using these figures, Project staff calculated that wastewater discharges contribute a total load of 48,493 kilograms of nitrogen to the Centerville River–East Bay System each year.⁷⁹

186. The Project's report accounts for nine properties (out of 6,936) within the drainage that use alternative septic systems with a nitrogen-reducing technology.⁸⁰

187. The Project's Centerville River–East Bay report uses water use data or extrapolation for every parcel in the drainage with a default septic system (accounting for the nine parcels using alternative systems), understanding that every default septic system in the watershed contributes nitrogen that pollutes the Centerville River–East Bay System. At no point does the Report qualify this determination.

⁷⁵ MEP, Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for Centerville River, Town of Barnstable, Massachusetts 9 (Nov. 2006) ("MEP Centerville Report").

⁷⁶ See id. at 28, 33.

⁷⁷ See id. at 30.

⁷⁸ See id. at 33.

⁷⁹ See id. at 38, tbl. IV-4.

⁸⁰ See id. at 34.

188. MassDEP expressed a "high degree of certainty in the final result" of this analysis of the watershed's hydrodynamics and water quality.⁸¹

189. MassDEP has not modified its statement of confidence in the Massachusetts Estuaries Project's model or conclusions.

190. MassDEP incorporated the Project's Centerville River–East Bay System into the Commonwealth's TMDL submission to EPA.⁸²

191. The Centerville River TMDL states that nitrogen concentrations in the Centerville River watershed would have to be reduced to 0.37 mg/L to attain Massachusetts Surface Water Quality Standards.⁸³

192. The Centerville River TMDL defines the following septic load reduction by subembayment which is "necessary" to achieve the watershed's TMDL:

> In the Centerville River East sub-embayment, from 45.929 kg/day to 9.184 kg/day.⁸⁴

193. In January 2008, EPA approved MassDEP's Centerville River–East Bay TMDL determination—including its incorporation of the Project's finding regarding all septic systems within the Centerville River–East Bay drainage.

194. Since EPA's approval of the Centerville River TMDL, no meaningful nitrogen reduction has been achieved in the Centerville River watershed.

195. The nitrogen reductions specified for the Centerville River watershed in the TMDL have not been met.

⁸¹ Centerville TMDL at 20.

⁸² Id. at 1.

⁸³ See id. at iii.

⁸⁴ See id. at 28 tbl. VIII-2.

196. Unless the nitrogen pollution originating from default septic systems is reduced to levels set in the TMDL (with further reductions established for other controllable sources of nitrogen) or the pollution is otherwise offset, the Centerville River watershed will deteriorate ecologically even further.

d. MassDEP's Determination Regarding Septic Systems in the Lewis Bay Watershed

197. The surface waters of the Lewis Bay watershed are eutrophic and "at risk of further degradation from increased N[itrogen] loads."⁸⁵

198. Nitrogen pollution has caused "degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources" in the Lewis Bay watershed.⁸⁶

199. In March 2015, MassDEP submitted a final TMDL report on Lewis Bay to EPA.

200. The pollutant of concern for this TMDL was nitrogen.⁸⁷

201. MassDEP's report attributed the effects of eutrophication—algal blooms, depleted oxygen, elimination of eelgrass meadows, crashes in biodiversity—to nitrogen pollution within the drainage.⁸⁸

202. MassDEP observed that "[w]astewater effluents (from septic systems and from wastewater treatment facilities) discharge to the ground, enter the groundwater system and eventually enter the surface water bodies."⁸⁹

203. According to MassDEP, nitrogen pollution has caused "degraded water quality, adverse impacts to ecosystems, and limits on the use of water resources" in Lewis Bay.⁹⁰

⁸⁵ Lewis Bay TMDL at 3.

⁸⁶ *Id.* at 3.

⁸⁷ See id. at 1.

⁸⁸ See id. at 1.

⁸⁹ Id. at 4.

⁹⁰ Id. at 3.

204. According to MassDEP's report, the largest controllable source polluting Lewis Bay with nitrogen is effluent from septic systems.⁹¹

205. MassDEP's TMDL analysis relies upon and incorporates the data and analysis of a
 2006 technical report on Lewis Bay by the Massachusetts Estuaries Project.⁹²

206. As with its Popponesset Bay, Three Bays Estuary, and Centerville River-East Bay System reports, the "core" of the Project's technical report on Lewis Bay is its "Linked Watershed-Embayment Management" model, the results of which were calibrated and validated against data collected in the field.⁹³

207. Project staff obtained data for the 8,085 developed parcels within the watershed from the Town of Barnstable, categorizing land parcel-by-parcel.⁹⁴

208. They obtained parcel water use information from the relevant water districts, allowing for an estimate of wastewater volume for on-site systems.

209. For parcels that use private wells—for which publicly available water use data was not available—Project staff extrapolated water use from similar parcels in the watershed.⁹⁵

210. Using this data, Project staff calculated that Lewis Bay received a total load of
 34,909 kilograms of nitrogen from wastewater each year.⁹⁶

211. The Project's Report accounts for three properties (out of 8,085) within the drainage that use alternative septic systems with a nitrogen-reducing technology.⁹⁷

⁹¹ See id. at 7.

⁹² See id. at 1.

⁹³ MEP, Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for Centerville River, Town of Barnstable, Massachusetts 7 ("MEP Lewis Bay Report").

⁹⁴ See id. at 28, 33.

⁹⁵ See id. at 33.

⁹⁶ See id. at 41, tbl. IV-3.

⁹⁷ See id. at 35.

212. The Project's Report uses water use data or extrapolation for every parcel in the drainage with a default septic system operating (accounting for the three parcels using alternative systems), understanding that every default septic system in the watershed contributes nitrogen that pollutes Lewis Bay. At no point does the Report qualify this determination.

213. MassDEP expressed a "high degree of certainty in the final result" of this analysis of the watershed's hydrodynamics and water quality.⁹⁸

214. MassDEP has not modified its statement of confidence in the Massachusetts Estuaries Project's model or conclusions.

215. MassDEP incorporated the Project's Lewis Bay Report into the Commonwealth's TMDL submission to EPA.

216. The Lewis Bay TMDL states that nitrogen concentrations in the Lewis Bay watershed would have to be reduced to 0.38 mg/L to attain Massachusetts Surface Water Quality Standards.⁹⁹

217. The Lewis Bay TMDL defines the following septic load reductions by subembayment which are "necessary" to achieve the watershed's TMDL¹⁰⁰:

- i. In the Lewis Bay sub-embayment, from 26.49 kg/day to 5.299 kg/day;
- ii. In the Mill Creek sub-embayment, from 13.57 kg/day to 1.926 kg/day;
- iii. In the Hyannis Inner Harbor sub-embayment, from 6.847 kg/day to 1.808 kg/day;
- iv. In the Mill Pond sub-embayment, from 2.488 kg/day to 2.479 kg/day; and

⁹⁸ Lewis Bay TMDL at 18-19.

⁹⁹ See id. at iii.

¹⁰⁰ See id. at 26 tbl. VIII-2.

 v. In the Hospital Creek/Hyannis Inner sub-embayment, from 1.907 kg/day to 0.326 kg/day.

218. In April 2015, EPA approved MassDEP's Lewis Bay TMDL submission including its incorporation of the Project's finding regarding all septic systems within the Lewis Bay drainage.

219. Since EPA's approval of the Lewis Bay TMDL, no meaningful nitrogen reduction has been achieved in Lewis Bay.

220. The nitrogen reductions specified for Lewis Bay in the TMDL have not been met.

221. Unless the nitrogen pollution originating from default septic systems is reduced to levels set in the TMDL (with further reductions established for other controllable sources of nitrogen) or the pollution is otherwise offset, the Lewis Bay watershed will deteriorate ecologically even further.

V. The Town of Barnstable Adopts MassDEP's Determinations.

222. Based on MassDEP's TMDLs for Popponesset Bay, Lewis Bay, the Three Bays Estuary, and the Centerville River–East Bay System, the Town of Barnstable adopted an Interim Regulation for the Protection of Saltwater Estuaries into its regulations governing onsite sewage disposal systems. Town of Barnstable Code § 360-45.

223. The Barnstable Interim Regulation states that "[t]he findings of a state-wide estuary investigation indicate that a substantial portion of the Town's saltwater estuaries are in jeopardy from the long-term buildup of nitrate-nitrogen, primarily from the subsurface discharge of sewage effluent." *Id*.

224. The Interim Regulations state that "most of the nitrate-nitrogen in these watersheds is from subsurface discharge of sewerage effluent into the groundwater that flows to these embayments," and recognize "the adverse impact to these estuaries from such discharges." *Id.*

225. By issuing the Interim Regulations, the Town of Barnstable incorporated all findings from MassDEP's Popponesset Bay, Three Bays Estuary, Centerville River-East Bay System, and Lewis Bay TMDLs into the Town of Barnstable's own determinations.

226. In November 2020, the Town of Barnstable submitted a final Comprehensive Wastewater Management Plan ("the Barnstable Plan") and associated environmental impact report to the MassDEP for review.

227. The Barnstable Plan finds "nitrogen has been causing eutrophication in coastal embayments."¹⁰¹

228. The Barnstable Plan attributes the waterbodies' nitrogen crises to pollution from septic systems. "The prevalence of nitrogen has become an issue due to the widespread reliance on on-site septic systems as a means of addressing wastewater."¹⁰²

229. The Barnstable Plan relies upon and incorporates the findings of the MEP Reports and TMDL determinations on Popponesset Bay, Lewis Bay, Three Bays Estuary, and the Centerville River-East Bay System.

VI. The Town of Mashpee Adopts MassDEP's Determination

230. In 1999, the Town of Mashpee initiated development of a Watershed Nitrogen Management Plan ("Watershed Nitrogen Management Plan") to address the Town's need to reduce nitrogen impacts to its coastal embayments, including the waters of the Popponesset Bay watershed, and to evaluate all options for restoring those embayments.¹⁰³

¹⁰¹ Town of Barnstable, *Comprehensive Wastewater Management Plan* 1-1 (Oct. 2019) *available at* https:// townofbarnstable.us/waterresources/cwmp-final.pdf.

 $^{^{102}}$ Id.

¹⁰³ See Town of Mashpee Sewer Commission, *Final Needs Assessment Report* 1-3 (2007) ("Needs Assessment Report").

231. The Town put development of the Watershed Nitrogen Management Plan on hold "as it awaited the results" of the MEP's study of, inter alia, the Popponesset Bay watershed.¹⁰⁴

232. After that report was issued in late 2004, in 2007, the Town issued the first phase of its Watershed Nitrogen Management Plan, a so-called Needs Assessment Report.

233. As Mashpee sought funds from the Massachusetts taxpayer for the development of this Watershed Nitrogen Management Plan, and in light of the Plan's likely environmental impact, the Town has submitted each phase in its Plan to the Commonwealth for review under the Massachusetts Environmental Policy Act.

234. In October 2007, the Town submitted the Needs Assessment Report to the Commonwealth as an official submittal of the Town of Mashpee.¹⁰⁵

235. Mashpee's Needs Assessment Report states that the purpose of the Town's Watershed Nitrogen Management Plan "is to provide an environmentally and economically sound plan for nitrogen reduction, wastewater treatment, and effluent recharge" in the Popponesset Bay watershed "based on the MEP findings."¹⁰⁶

236. The Needs Assessment Report observed that "Mashpee is the fastest-growing town on Cape Cod At the same time, it is located almost entirely within the watersheds of two shallow, nitrogen-sensitive embayments—Popponesset Bay and Waquoit Bay East. The estuarine systems of both bays have shown significant signs of degradation, which has been documented to be attributable to excessive inputs of nitrogen."¹⁰⁷

¹⁰⁴ *Id.* at 1-1.

¹⁰⁵ See Commonwealth of Massachusetts, *Certificate of the Secretary of Energy and Environmental Affairs on the Notice of Project Change* (October 2007), *available at* https://www.mashpeema.gov/sites/g/files/vyhlif3426/f/ uploads/00074npc11-26-07.pdf (last accessed Jun. 10, 2021).

¹⁰⁶ Needs Assessment at 1-2.

¹⁰⁷ *Id.* at 1-2.

237. It goes on, "The main source of nitrogen is the sub-surface disposal of domestic wastewater through septic systems or cesspool systems and the migration of the nitrogen in the wastewater to the estuary via groundwater. *The MEP reports have documented these impacts*".¹⁰⁸

238. The Needs Assessment Report states that it builds upon the information developed by the MEP Report and TMDL for Popponesset Bay.¹⁰⁹

239. As the Needs Assessment report states, "the [Watershed Nitrogen Management Plan] analysis will follow the general framework of the MEP analysis,"¹¹⁰ and thus incorporates by reference the MEP Report's recognition that every default septic system operating in the Popponesset Bay drainage contributes nitrogen pollution to the surface waters of the watershed.

240. At no point does the Town contradict the MEP's finding that all default septic systems operated in the Popponesset Bay drainage contributed nitrogen pollution to the watershed's surface waters.

241. On the contrary, the Town elaborates: "Typical Title 5 approved septic systems provide minimal nitrogen removal and are usually the largest source of nitrogen to coastal embayments. Typical Title 5 approved systems can be upgraded to remove nitrogen, and these systems are often called "Innovative and Alternative (I/A) Systems."¹¹¹

242. While default septic systems are "very effective at removing settleable solids and getting the effluent into the ground," the Town observed that "very limited treatment is provided by this system."¹¹²

¹⁰⁸ Id.

¹⁰⁹ See id. at 1-5.

¹¹⁰ Id. at 7-2.

¹¹¹ Id. at 5-6.

¹¹² *Id.* at 6-2

243. Within the Popponesset Bay watershed, "Title 5 septic systems make up a significant portion of the wastewater treatment These systems typically discharge effluent with total nitrogen (TN) concentrations in the neighborhood of 35 mg/L, of which approximately 75% reaches the groundwater table (as identified by MEP) The estuaries have reached their nutrient-impacted conditions under these current practices; therefore, these concentrations must be reduced to see improvements in estuary health."¹¹³

244. The Town of Mashpee submitted a final Comprehensive Wastewater Management Plan ("the Mashpee Plan") and an associated environmental impact report to MassDEP for review in May 2015.

245. The Mashpee Plan proposes a program of five 5-year phases, lasting from 2017 until 2041,¹¹⁴ "through shellfish aquaculture supported by a minimum amount of traditional infrastructure to start."¹¹⁵

246. The Mashpee Plan concedes that the shellfish program is experimental. It states that, "[d]ue to the complexity of using shellfish to achieve TMDL compliance, the plan is not able to project beyond the initial phase of nitrogen removal, as shellfish are anticipated to be able at a minimum to remove some portion of the load, therefore nitrogen loading is evaluated on 5-year intervals in order to see what amount of traditional or other approaches would be needed in the subsequent phases."¹¹⁶

247. The Town's Mashpee Plan is premised upon and incorporates by reference the Popponesset Bay TMDL.¹¹⁷

¹¹³ *Id.* at 7-2

¹¹⁴ See Mashpee Plan at 9-2 to 9-6.

¹¹⁵ *Id.* at 6-1.

¹¹⁶ *Id.* at 6-2

¹¹⁷ See id. at ES-1.

VII. Defendants' Inaction Allows the Nitrogen Crisis to Continue.

248. MassDEP and the Towns of Barnstable and Mashpee continue to approve the construction of default septic systems within the drainages of the Southern Cape Coastal Waters.

249. Following their determinations that septic systems within the Southern Cape Coastal Waters drainage are causing the nitrogen crisis, the Towns and MassDEP have issued numerous Disposal System Construction Permits, authorizing the construction or modification of default septic systems in the Southern Cape Coastal Waters drainage, and numerous Certificates of Compliance, authorizing the use of newly constructed or modified default septic systems in the Southern Cape Coastal Waters drainage.

250. The following maps depict the locations of Disposal System Construction Permits, Certificates of Compliance, and Disposal System Repairs for default septic systems issued by the Town of Barnstable and the Town of Mashpee between 2009-2019 within the Southern Cape Coastal Waters drainage:



Data obtained via Public Records of Request / Freedom of Information Act

Barnstable Septic: Centerville River Watershed



Data obtained via Public Records of Request / Freedom of Information Act

Barnstable Septic: Lewis Bay Watershed



Data obtained via Public Records of Request / Freedom of Information Act

Barnstable Septic: Three Bays Watershed



Data obtained via Public Records of Request / Freedom of Information Act

Barnstable Septic: Popponesset Bay Watershed



Data obtained via Public Records of Request / Freedom of Information Act

Mashpee Septic: Popponesset Bay Watershed



Data obtained via Public Records of Request / Freedom of Information Act

Barnstable and Mashpee Combined Septic: Popponesset Bay Watershed

251. The maps above also show the thousands of passed system inspections accepted by the Towns of Barnstable and Mashpee between 2009-2019.

252. In issuing permits and accepting inspection forms, Defendants have knowingly accepted the false representations in these forms that the inspected systems were not discharging pollutants directly or indirectly into surface waters of the Commonwealth or contributing to violations of the Massachusetts Water Quality Standards.

253. Yet, both MassDEP and the Towns have long-ago determined that all default septic systems within the Southern Cape Coastal Waters' drainage are polluting and will continue to pollute the Waters with septic effluent and contribute to their nitrogen pollution crisis.

254. Since March 2015, MassDEP has issued no orders mandating the upgrade of default septic systems to prevent nitrogen pollution of the Southern Cape Coastal Waters.

255. Since March 2015, the Towns have issued no orders mandating the upgrade of default septic systems to prevent nitrogen pollution of the Southern Cape Coastal Waters.

256. As described above, MassDEP is mandated to implement and enforce legal requirements to assure the effectiveness of the inspection of Title 5 systems including suspending approvals of System Inspectors for inaccurate inspections.

257. MassDEP has not suspended approvals of MassDEP-approved and trained System Inspectors for unlawfully passing thousands of systems in Barnstable and Mashpee in the face of Defendants' own long-standing determinations that the systems discharge nitrogen waste directly or indirectly into the Southern Cape Coastal Waters and therefore trigger "failure criteria" under Title 5.

258. MassDEP has not mandated training of inspectors regarding MassDEP's determinations that all default septic systems within the relevant drainages are contributing nitrogen wastes directly or indirectly into the Southern Cape Coastal Waters.

259. MassDEP has not developed or approved inspector training materials regarding its determination that all traditional septic systems within the relevant drainages are contributing nitrogen wastes directly or indirectly into the Southern Cape Coastal Waters.

CLAIMS

COUNT I: ENVIRONMENTAL DAMAGE, G. L. C. 214, § 7A AGAINST ALL DEFENDANTS

260. Plaintiffs incorporate the allegations contained in the above paragraphs as though fully set forth herein.

261. MassDEP, the Town of Barnstable, and the Town of Mashpee have determined that default septic systems in the Towns of Barnstable and Mashpee are discharging nitrogen directly or indirectly to a surface water of the Commonwealth, in violation of 310 Code Mass. Regs. §§ 15.024(8), 15.303(1)(a)(2).

262. MassDEP, the Town of Barnstable, and the Town of Mashpee have taken no actions to halt illegal discharges of nitrogen pollution from these septic systems into the surface waters in the Towns of Barnstable and Mashpee.

263. MassDEP, the Town of Barnstable, and the Town of Mashpee have issued no orders mandating upgrades of these systems on account of these illegal discharges, as they are required to do under Title 5.

264. MassDEP has also failed in its mandatory obligation to train and approve competent site inspectors to assure the integrity of the Title 5 inspection program.

265. Defendants are causing damage to the environment in failing their duties to implement and enforce Title 5.

266. Their failures have caused and continue to cause discharges of nitrogen pollution to the Southern Cape Coastal Waters, resulting in the environmental harm and harms to Plaintiffs as described above.

COUNT II: MANDAMUS, G. L. C. 249, § 5 AGAINST ALL DEFENDANTS

267. Plaintiffs incorporate the allegations contained in the above paragraphs as though fully set forth herein.

268. As the Local Approving Authorities, the Barnstable and Mashpee Boards of Health, arms of the Towns of Barnstable and Mashpee respectively, have a mandatory duty to implement and enforce the Title 5 regulations. 310 Code Mass. Regs. § 15.025; G. L. c. 21A § 13.

269. For the reasons stated above, the Town of Barnstable and the Town of Mashpee have failed to carry out this duty by failing to enforce the mandatory requirement that owners and operators of default septic systems in the Towns of Barnstable and Mashpee respectively upgrade those systems to stop the illegal discharge of nitrogen-containing effluent directly or indirectly to surface waters of the Commonwealth.

270. MassDEP has a mandatory duty to oversee the Towns' Boards of Health as they implement and enforce of Title 5 regulations. 310 Code Mass. Regs. § 15.025.

271. MassDEP has a mandatory obligation to train and approve competent septic System Inspectors to assure the integrity of the Title 5 inspection program.

272. For the reasons stated above, MassDEP has failed to carry out its duties by failing to order and enforce the mandatory requirement that owners and operators of default septic systems

in the Towns of Barnstable and Mashpee upgrade those systems to stop the illegal discharge of nitrogen-containing effluent directly or indirectly to surface waters of the Commonwealth and by failing to train and approve—and where necessary suspend approval of—System Inspectors to maintain the integrity of Title 5 inspections in the Commonwealth.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs respectfully request that this Court grant the following relief.

- A. Enter a judgment declaring that:
 - Defendants have determined under 310 Code Mass. Regs. § 15.303(1) that default septic systems in the drainage of the Southern Cape Coastal Waters in the Towns of Barnstable and Mashpee are discharging effluent containing nitrogen directly or indirectly to surface waters of the Commonwealth;
 - By failing to order the upgrade of default septic systems, Defendants allow these systems to pollute the surface waters of the Commonwealth, fail to protect public health and safety and the environment, and are in breach of their mandatory duties under Title 5;
 - iii. Pursuant to 310 Code Mass. Regs. § 15.303(1), default septic systems in the drainage of the Southern Cape Coastal Waters in the Towns of Barnstable and Mashpee must be ordered "upgraded in accordance with the timeframes of 310 CMR 15.305(1) and the standards of 310 CMR 15.404 and 15.405"; and
 - MassDEP has failed to train and approve competent System Inspectors, compromising the integrity of the Title 5 inspection regime in the Commonwealth.
- B. Enter an order that:

- i. enjoins Defendants within 90-days from judgment, to jointly submit for the Court's approval a proposed plan, not more than five years in duration, by which Defendants will order all owners and operators of default septic systems in the drainage of the Southern Cape Coastal Waters in the Town of Barnstable to "upgrade[] in accordance with the timeframes of 310 CMR 15.305(1)" so as to stop the discharges of effluent containing nitrogen directly or indirectly to surface waters of the Commonwealth; the order should set a date 150 days from judgment for a hearing on Defendants' proposed plan, before which Plaintiffs will be afforded an opportunity to object to the proposed plan; the plan, as approved by the Court, would take the form of a five year consent decree, over which the Court would maintain jurisdiction;
- ii. enjoins Defendants, during the pendency of the development and implementation of Defendants' court-supervised plan, from authorizing the installation or modification of, or accepting a passing inspection report for, any default septic system within the drainage of the Southern Cape Coastal Waters;
- iii. enjoins MassDEP to update its guidance to approved System Inspectors to (1) inform System Inspectors of MassDEP's official determination that default septic systems within the Southern Cape Coastal watersheds are discharging nitrogen effluent directly or indirectly to surface waters of the Commonwealth, and (2) expressly require System Inspectors to determine whether a particular system is discharging or will discharge effluent to

surface waters of the Commonwealth when deciding whether a system passes inspection;

- iv. enjoins MassDEP to suspend approvals and renewal approvals of System Inspectors until such time as MassDEP has developed training materials and programs sufficient to fully disclose and apprise System Inspectors of MassDEP's determinations that Title 5 systems are discharging nitrogen wastes directly or indirectly into the Southern Cape Coastal Waters consistent with the TMDLs; and
- v. enjoins the Town of Barnstable and the Town of Mashpee to propose, for the Court's approval, a supplement to the MassDEP approved Inspection Form requiring that (1) System Inspectors certify whether the inspected system is likely to discharge effluent containing nitrogen directly or indirectly to the surface waters of the Commonwealth, and, (2) if not, the System Inspector describe the circumstances making such discharge unlikely.
- C. Grant Plaintiffs their costs and fees; and
- D. Grant such other relief as may be just and equitable.

Respectfully submitted,

San Coshile

Ian D. Coghill BBO # 685754 62 Summer Street Boston, MA 02110 (617) 850-1739 icoghill@clf.org