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Fall 2020

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Maintenance of Water and Sewer Infrastructure in Response to Sea Level Rise in Massachusetts

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Updated fall 2020

This fact sheet was produced by the Marine Affairs Institute at Roger Williams University School of Law/Rhode Island Sea Grant Legal Program with funding from Rhode Island Sea Grant. This is one of a series of fact sheets designed to highlight key concepts of state and local government liability risks as those governments prepare for the effects of climate change throughout New England. This fact sheet was produced in partnership with MIT Sea Grant and Woods Hole Sea Grant.

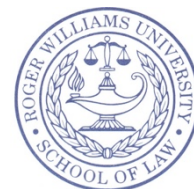
1 Scope of this fact sheet

In Massachusetts, water and sewer infrastructure is primarily operated by state and local government entities. These entities are obligated to maintain the infrastructure in good repair. Rising sea levels threaten this infrastructure with inundation from flooding and infiltration from rising groundwater. For example, the Deer Island Sewage Treatment Plant, which services the Boston area, is located within the 100-year floodplain and is expected to be subject to frequent storm surge as sea levels rise.¹

Sea level rise will increase the frequency of flooding of coastal infrastructure, which may lead to saltwater contamination of surface drinking water sources, destruction of treatment plants, and corrosion of infrastructure from increased contact with saltwater. Groundwater will also rise in close proximity to the coast. This groundwater rise will cause similar contamination of underground water sources and damage to pipe systems. State and local government alterations, repairs, or failure to maintain their infrastructure in light of these impacts could expose them to liability for resulting harms to private property.

This fact sheet will provide an overview of Massachusetts drinking water and wastewater infrastructure, the risks that sea level rise and groundwater rise pose to that infrastructure, and possible solutions to combat those risks. Additionally, it will provide insight into state and local liability for management decisions. It will help answer common questions:

- Could a town be liable for a decision to alter its drinking water or sewer system to address the risks brought by climate change?



- Could a town be liable if it does not upgrade its drinking water or sewer system to address sea level and groundwater rise and a system fails?
- Could the Commonwealth be liable for enacting regulations aimed to decrease the water quality risks of failing septic systems?

2 Water and sewer infrastructure in Massachusetts

Drinking water in Massachusetts is derived from various sources. In the greater Boston area, the Massachusetts Water Resources Authority (MWRA) supplies drinking water from naturally-occurring surface water reservoirs.² On Cape Cod, groundwater is the sole source of drinking water.³ Regardless of the source, the water is typically pumped into a pipe system, sent to a water treatment plant, and then distributed via local distribution pipes.⁴ Municipally owned infrastructure accounts for most of Massachusetts' water infrastructure, and state entities own the remainder.⁵

Residential wastewater is piped from homes to treatment plants via sewer systems.⁶ After treatment, the effluent is discharged into the environment, usually into a nearby waterbody.⁷ Recently constructed sewer systems separate sanitary sewer and stormwater flow, but older cities still utilize combined sewer overflows (CSOs).⁸ Sanitary sewer systems commonly are maintained by municipal or regional sewer departments.⁹ However, some sewer infrastructure is owned by state entities, like the MWRA.¹⁰ This fact sheet will address both state- and local-owned infrastructure. One additional wastewater treatment system that will be considered in this fact sheet is the privately-owned septic system.¹¹ These systems are prevalent throughout New England with almost half of all homes utilizing them rather than public sewer systems.¹² On Cape Cod, approximately eighty-five percent of residents use septic systems.¹³ These systems treat wastewater on-site, and most require that water percolate through the soil for filtration.¹⁴

3 Risks associated with sea level rise

Sea level rise poses several risks to water and sewer infrastructure, starting at the water source. Surface waters that are located within the floodplain may become inundated with saltwater during storm events or high tides.¹⁵ Additionally, in coastal areas, groundwater sources are stratified with a layer of freshwater on top of a layer of saltwater.¹⁶ As sea level rises, the saltwater layer will rise, raising the total groundwater level and also potentially intruding upon freshwater aquifers used for drinking water.¹⁷

Water and sewer pipes and other conveyance infrastructure may be subject to flooding, both above the surface from sea level rise and storm surge as well as underground from rising groundwater.¹⁸ As floodwaters will include saltwater, pipes and other infrastructure will be vulnerable to corrosion.¹⁹ Another problem for pipe systems is infiltration and inflow (I/I), which occurs when groundwater, rainwater, or snowmelt enters the pipes through defects.²⁰ This I/I can contaminate drinking water and back up sewer systems.²¹ Groundwater rise and increased storm events may increase the frequency of I/I.²² Sewer systems also have limited capacity. When systems become overloaded from high tide or storms, communities may flood from backed up sewers.²³ CSOs pose an additional

risk because overwhelmed CSOs divert overflow of combined stormwater and sewage directly into local waterbodies without treatment, compromising water quality.²⁴

Like conveyance pipes, treatment plants can suffer from corrosion and I/I.²⁵ Treatment plants are at high risk of flooding, especially sewage treatment plants due to their location in low-lying areas.²⁶ Flooding can damage electrical equipment, potentially shutting down an entire plant.²⁷ If flood waters enter sewage treatment tanks, the saltwater can kill the bacteria in those tanks, requiring time consuming and costly re-seeding to restart the systems.²⁸

Like public infrastructure, septic systems also face risks, beyond risks like corrosion and I/I. Septic systems rely on unsaturated soils for filtration, and rising groundwater levels will saturate the soils and reduce the ability of the system to function properly.²⁹ Potential flooding from sea level rise, storm surge, and increased precipitation will exacerbate the soil saturation problem.³⁰ Failed septic systems can create water quality problems for the surrounding area and expense for homeowners.³¹

4 Potential methods to address sea level rise effects

Several methods are available to address the threats of sea level rise on water and sewer infrastructure. For drinking water source contamination, desalination could make water potable again, although that would elevate the cost of supplying drinking water.³² Construction of intrusion barriers could physically block the movement of saltwater into freshwater drinking sources.³³ If other methods are not feasible or are prohibitively expensive, a municipality may be left only with the option to abandon the affected water source and transport water from new locations.³⁴

Solutions to address the effects on conveyance pipes are limited. Keeping pipes in good repair is the best way to reduce I/I.³⁵ Exposure to saltwater may accelerate the rate of corrosion of pipes, requiring more frequent replacement.³⁶ Re-routing the pipes inland or using corrosion-resistant materials are two options for reducing the need for increased maintenance. To reduce the water quality risks of CSOs, communities can create long-term control plans or separate sewer and stormwater systems.³⁷

For treatment plants, like for conveyance systems, use of corrosion-resistant materials may help reduce the frequency of necessary repairs. Elevation of key infrastructure such as electrical equipment may allow the plant to remain operational during a flood.³⁸ Physical barriers like berms or underground intrusion barriers could help reduce the occurrence of inundation.³⁹ Flood-proofing treatment plants, especially bacteria tanks, can help plants survive inundation without significant restart costs.⁴⁰ Physically relocating a plant inland to eliminate the risk of flooding may be an appealing solution when the plant is nearing the end of its useful life.⁴¹

For septic systems, Massachusetts currently requires a soil evaluation and other testing prior to approval of a new system to be sure that the site can accommodate the system's demands.⁴² State

law also sets a minimum vertical separation between the septic system and the high groundwater elevation.⁴³ However, the method for establishing the groundwater elevation is based on historical data and does not consider future groundwater rise.⁴⁴ The state or local municipalities can respond to the impacts of sea level rise by: (1) requiring consideration of future projected groundwater levels rather than historical levels; (2) setting a larger minimum vertical separation to provide a buffer for future rise; or (3) restricting use of septic systems in areas where groundwater rise is projected.⁴⁵

5 Potential liability for responses to risks

In deciding upon a course of action, the Commonwealth or a municipality may open itself up to liability. Governments have an obligation to maintain their infrastructure in good repair.⁴⁶ Allowing infrastructure to fall into disrepair or making changes that result in harm to residents or their property could result in tort liability, such as negligence, nuisance, or trespass.⁴⁷

For example, in *Shapiro v. City of Worcester*, the plaintiffs filed suit against the city for nuisance and trespass when sewer infrastructure repeatedly backed up onto their properties.⁴⁸ The city had entered into an agreement that allowed additional use of the sewer system, but the system was never redesigned to accommodate the increased load.⁴⁹ Therefore, the plaintiffs brought suit alleging that the city had foreseen the potential for overloading the sewer and had allowed the increased load without taking action to address the risk, which resulted in harm to the plaintiffs.⁵⁰ Before the court could reach the merits of the plaintiffs' claims, it first had to address the city's claim of sovereign immunity, a possibility considered below.

Negligence claims may arise as residents allege that a government was negligent in altering or failing to maintain a water or sewer system. To prove a negligence claim, a plaintiff will need to prove four elements: "[1] the defendant owed the plaintiff a duty of reasonable care, [2] that the defendant breached this duty, [3] that damage resulted, and [4] that there was a causal relation between the breach of the duty and the damage."⁵¹ During this inquiry, one important factor will be whether the harm was foreseeable.⁵² Given the current state of the science of sea level rise, a court could find that the effects of sea level rise are foreseeable and a municipality should plan for those effects.

Even if the Commonwealth or a municipality could potentially be liable for the effects of a management decision, the doctrine of sovereign immunity may bar a resident from bringing suit. Sovereign immunity prevents the government from being sued without its consent.⁵³ The Massachusetts Tort Claims Act (MTCA) waives sovereign immunity only for "injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any public employee while acting within the scope of his office or employment."⁵⁴ Therefore, unless an exception applies, Massachusetts state and local governments can be sued in negligence when an employee's actions or inactions taken within the scope of employment breach a duty of care owed to a person and cause harm.⁵⁵

The MTCA provides a second level of government protection with ten exceptions where a government cannot be sued, even for action that would otherwise be subject to suit under the

MTCA. Of particular relevance to the question of maintenance of infrastructure, a government entity cannot be sued based upon “the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a public employer or public employee, acting within the scope of his office or employment, whether or not the discretion involved is abused.”⁵⁶

The Massachusetts Supreme Judicial Court (SJC) explained that determination of whether this discretionary function exception applies in a given case follows a two-prong test.⁵⁷ First, the court will consider “whether the governmental actor had any discretion at all.”⁵⁸ If the actor did have discretion, the court then considers whether that discretion is “that kind of discretion” for which the MTCA exception is designed.⁵⁹ Though the court will evaluate the second prong on a case-by-case basis, the general standard is that “planning and policymaking” decisions are entitled to immunity while “implementation and execution” of those policies are not entitled to immunity.⁶⁰

In applying the two-prong analysis to the facts in *Shapiro*, the SJC held that the city was not entitled to sovereign immunity because, although the city had discretion in making improvements to the sewer system, the city had already decided to improve the sewer system and its failure was in execution of that plan.⁶¹ In contrast, the Superior Court of Massachusetts found in *Canterbury Automotive, Inc. v. City of Worcester* that the city was entitled to sovereign immunity when its decisions to upgrade the storm drainage system failed to prevent flooding of the plaintiff’s property.⁶² The court held that the city had a finite level of resources and its decisions on which sections of the drainage system to improve were “the type of discretionary resource allocation decisions that are protected from liability” by the MTCA.⁶³ As these two cases demonstrate, a court is more likely to find that high-level decision making, such as deciding where to locate a sewage treatment plant, is entitled to sovereign immunity while execution of those plans, such as carrying out the physical construction of the plant, is not entitled to sovereign immunity.

Massachusetts sets regulations of septic systems, but municipalities are permitted to set more restrictive regulations.⁶⁴ Therefore, either the Commonwealth or local communities could take steps to protect against the negative effects of groundwater rise on septic systems. Since septic systems are privately owned and operated on private land, the major legal risk likely to be faced will be takings claims, allegations that private property has been taken for a public purpose.⁶⁵ While each instance of a takings claim will be evaluated on its own unique circumstances, courts have upheld restrictions on septic systems based upon protections of environmental conditions.⁶⁶

6 Potential liability for failing to act

The Commonwealth and municipalities face potential liability from preparing infrastructure for the effects of sea level rise, yet failure to act also has liability risks. Government entities are responsible for keeping infrastructure in good repair.⁶⁷ In making broad management decisions on how and where to make improvements to its infrastructure, a government may be entitled to sovereign immunity.⁶⁸ However, basic maintenance is a requirement, and sovereign immunity will not apply for failure to maintain infrastructure.⁶⁹ As noted above, sea level rise will necessitate increased repair costs due to flooding and corrosion. The Commonwealth and its municipalities will need to evaluate

whether financial and logistical resources favor meeting the minimum standard of effecting more frequent repairs or taking affirmative actions to reduce the cost of future repairs.

7 Conclusion

Sea level rise and the resulting flooding and groundwater rise will increasingly have negative effects on coastal water and sewer infrastructure in Massachusetts. The Commonwealth and its coastal communities will need to decide on the best methods to protect infrastructure from these risks. The MTCA provides extensive protection for governments in the choices made to modify infrastructure, but it does not insulate them from liability for failing to maintain infrastructure. They should consider the costs of possible actions, the risks associated with those actions or with inaction, and consult with local counsel, engineers, and other experts when evaluating options to maintain their water and sewer infrastructure in light of sea level rise.

¹ MASS. EXEC. OFFICE OF ENERGY AND ENVTL. AFFAIRS AND THE ADAPTATION ADVISORY COMM., MASS. CLIMATE CHANGE ADAPTATION REPORT 54 (2011) [herein after MASS. ADAPTATION REPORT].

² Mass. Water Res. Auth., *How the MWRA Water System Works*, MWRA ONLINE, <http://www.mwra.com/04water/html/watsys.htm> (last visited Jan. 16, 2019).

³ U.S. GEOLOGICAL SURVEY, FACT SHEET 2014-3067: SCIENCE FOR THE STEWARDSHIP OF THE GROUNDWATER RESOURCES OF CAPE COD, MASS. 1 (2014), available at <https://pubs.usgs.gov/fs/2014/3067/pdf/fs2014-3067.pdf>.

⁴ Mass. Water Res. Auth., *supra* note 2.

⁵ MASS. ADAPTATION REPORT, *supra* note 1, at 59; Mass. Water Res. Auth., *supra* note 2.

⁶ Mass. Water Res. Auth., *How the Sewer System Works*, MWRA ONLINE, <http://www.mwra.state.ma.us/03sewer/html/sewhow.htm> (last visited Mar. 13, 2019).

⁷ *Id.*

⁸ Mass. Dep't of Envtl. Prot., *Sanitary Sewer Systems & Combined Sewer Overflows*, MASS.GOV, <https://www.mass.gov/guides/sanitary-sewer-systems-combined-sewer-overflows> (last visited Jan. 22, 2019).

⁹ *Id.*

¹⁰ Mass. Water Res. Auth., *About MWRA*, MWRA ONLINE, <http://www.mwra.com/02org/html/whatis.htm> (last visited Jan. 17, 2019).

¹¹ Cesspools without an associated septic system also still exist in Massachusetts. However, under state law cesspools must meet heightened criteria to obtain inspection approval. *See* 310 MASS. CODE REGS. § 15.303 (Westlaw 2019). Municipalities are permitted to set more stringent requirements “to protect public health, safety, welfare and the environment.” *Id.* § 15.003(3). In most towns, they are considered nonconforming uses, and when they fail, they must be replaced by a septic system. Some towns even require conversion to a septic system any time a property using a cesspool is sold. Cynthia McCormick, *Dennis cesspool battle reaches brink*, CAPE COD TIMES (Feb. 10, 2012 2:00 AM), <https://www.capecodtimes.com/article/20120210/news/202100313>. Because of their limited use in the state, standalone cesspools will not be considered in this fact sheet.

¹² Elena Mihaly, *Avoiding Septic Shock: How Climate Change Can Cause Septic System Failure and Whether New England States are Prepared*, 23 OCEAN & COASTAL L.J. 1, 2 (2018).

¹³ *Id.* at 20.

¹⁴ *Id.* at 4.

¹⁵ MASS. ADAPTATION REPORT, *supra* note 1, at 82.

¹⁶ U.S. GEOLOGICAL SURVEY, *supra* note 3, at 3.

¹⁷ *Id.* at 4.

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- ¹⁸ *Id.*; Edna Sussman et al., *Climate Change Adaptation: Fostering Progress Through Law and Regulation*, 18 N.Y.U. ENVTL. L.J. 55, 106 (2010).
- ¹⁹ STRAFFORD REG'L PLANNING COMM'N, SEA-LEVEL RISE IMPACTS ON DRINKING WATER: A GROUNDWATER MODELING STUDY IN NEWMARKET, N.H. 16 (2016).
- ²⁰ Mass. Dep't of Env'tl. Prot., *supra* note 8.
- ²¹ *See id.*
- ²² *See id.*
- ²³ Erica Mattison, *Underwater: The Need for Massachusetts to Become Climate Ready*, 8 FLA. A&M U. L. REV. 327, 327-28 (2013).
- ²⁴ Alice Kaswan, *Domestic Climate Change Adaptation and Equity*, 42 Env'tl. L. Rep. News & Analysis 11125, 11130 (2012).
- ²⁵ *See* STRAFFORD REG'L PLANNING COMM'N, *supra* note 19, at 16.
- ²⁶ Sussman, *supra* note 18, at 106.
- ²⁷ MASS. ADAPTATION REPORT, *supra* note 1, at 60.
- ²⁸ STRAFFORD REG'L PLANNING COMM'N, *supra* note 19, at 16. Bacteria consume organic matter present in the wastewater, removing contaminants that are too small to settle naturally as well as reducing the overall quantity of waste for disposal. *See* Mass. Water Res. Auth., *supra* note 6.
- ²⁹ Mihaly, *supra* note 12, at 4.
- ³⁰ *Id.* at 2, 5; *see* Mass. Dep't of Env'tl. Prot., *Septic Systems & Title 5 New Construction*, MASS.GOV, <https://www.mass.gov/service-details/septic-systems-title-5-new-construction> (last visited Mar. 13, 2019).
- ³¹ *See* Mihaly, *supra* note 12, at 7.
- ³² MASS. ADAPTATION REPORT, *supra* note 1, at 18; STRAFFORD REG'L PLANNING COMM'N, *supra* note 19, at 8.
- ³³ STRAFFORD REG'L PLANNING COMM'N, *supra* note 19, at 21. For groundwater sources, freshwater can be injected into intrusion barrier wells to block saltwater intrusion. *Id.* at 23, app. C at 8.
- ³⁴ *See id.* at 9, 22.
- ³⁵ *Id.* at 26.
- ³⁶ *Id.* at 9.
- ³⁷ *See* MASS. ADAPTATION REPORT, *supra* note 1, at 61.
- ³⁸ *See id.* at 61.
- ³⁹ *See* STRAFFORD REG'L PLANNING COMM'N, *supra* note 19, at 21.
- ⁴⁰ *See* MASS. ADAPTATION REPORT, *supra* note 1, at 55.
- ⁴¹ *See id.* at 55, 60; Mattison, *supra* note 23, at 345.
- ⁴² *See* 310 MASS. CODE REGS. 15.100 through 15.107 (Westlaw 2018) (septic system siting regulations).
- ⁴³ *Id.* at 15.212(1); *see id.* at 15.103(3) (method to determine high groundwater elevation).
- ⁴⁴ Mihaly, *supra* note 12, at 19.
- ⁴⁵ *See* MASS. ADAPTATION REPORT, *supra* note 1, at 112 (contemplating increasing vertical separation requirements); Mihaly, *supra* note 12, at 19.
- ⁴⁶ *Twomey v. Commonwealth*, 825 N.E.2d 989, 993 (Mass. 2005) (citing MASS. GEN. LAWS ch. 258, § 10(j)(3)).
- ⁴⁷ *See id.* at 990 (claim for negligent maintenance); *Canterbury Automotive, Inc. v. City of Worcester*, No. 2011-01486, 2014 WL 841628, at *5 (Mass. Super. Ct. Jan. 15, 2014) (quoting *Doe v. New Bedford Housing Auth.*, 630 N.E.2d 248, 257 (1994)) (observing that a “nuisance is actionable when ‘a property owner creates, permits or maintains a condition or activity on his property that causes a substantial and unreasonable interference with the use and enjoyment of the property of another’”). Management decisions could also lead to takings claims from harms to private property interests, but such claims are beyond the scope of this fact sheet. For a discussion of takings claims in Massachusetts, *see* MELISSA R. CHALEK, *TAKINGS LIABILITY AND COASTAL MANAGEMENT IN MASSACHUSETTS* (May 2019) (on file with author).
- ⁴⁸ 982 N.E.2d 516, 519 (Mass. 2013).
- ⁴⁹ *Id.* at 520.
- ⁵⁰ *Id.*

⁵¹ *Williams v. Steward Health Care System, LLC*, 103 N.E.3d 1192, 1196 (Mass. 2018) (quoting *Jupin v. Kask*, 849 N.E.2d 829, 834-35 (Mass. 2006)).

⁵² *Hebert v. Enos*, 806 N.E.2d 452, 455 (Mass. App. Ct. 2004) (citing *Kent v. Commonwealth*, 771 N.E.2d 770, 777 (Mass. 2002)) (noting that a negligence claim requires proof that the plaintiff's injury "was a foreseeable result of the defendant's negligent conduct").

⁵³ *See Randall v. Haddad*, 10 N.E.3d 1099, 1105 (Mass. 2014).

⁵⁴ MASS. GEN. LAWS ANN. ch. 258, § 2 (Westlaw 2018).

⁵⁵ *See Williams*, 103 N.E.3d at 1196.

⁵⁶ MASS. GEN. LAWS ANN. ch. 258, § 10(b). The ten exclusions, in full, are:

- (a) any claim based upon an act or omission of a public employee when such employee is exercising due care in the execution of any statute or any regulation of a public employer, or any municipal ordinance or by-law, whether or not such statute, regulation, ordinance or by-law is valid[;]
- (b) any claim based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a public employer or public employee, acting within the scope of his office or employment, whether or not the discretion involved is abused[;]
- (c) any claim arising out of an intentional tort, including assault, battery, false imprisonment, false arrest, intentional mental distress, malicious prosecution, malicious abuse of process, libel, slander, misrepresentation, deceit, invasion of privacy, interference with advantageous relations or interference with contractual relations[;]
- (d) any claim arising in respect of the assessment or collection of any tax, or the lawful detention of any goods or merchandise by any law enforcement officer[;]
- (e) any claim based upon the issuance, denial, suspension or revocation or failure or refusal to issue, deny, suspend or revoke any permit, license, certificate, approval, order or similar authorization[;]
- (f) any claim based upon the failure to inspect, or an inadequate or negligent inspection, of any property, real or personal, to determine whether the property complies with or violates any law, regulation, ordinance or code, or contains a hazard to health or safety, except as otherwise provided in clause (1) of subparagraph (j)[;]
- (g) any claim based upon the failure to establish a fire department or a particular fire protection service, or if fire protection service is provided, for failure to prevent, suppress or contain a fire, or for any acts or omissions in the suppression or containment of a fire, but not including claims based upon the negligent operation of motor vehicles or as otherwise provided in clause (1) of subparagraph (j)[;]
- (h) any claim based upon the failure to establish a police department or a particular police protection service, or if police protection is provided, for failure to provide adequate police protection, prevent the commission of crimes, investigate, detect or solve crimes, identify or apprehend criminals or suspects, arrest or detain suspects, or enforce any law, but not including claims based upon the negligent operation of motor vehicles, negligent protection, supervision or care of persons in custody, or as otherwise provided in clause (1) of subparagraph (j)[;]
- (i) an [sic] claim based upon the release, parole, furlough or escape of any person, including but not limited to a prisoner, inmate, detainee, juvenile, patient or client, from the custody of a public employee or employer or their agents, unless gross negligence is shown in allowing such release, parole, furlough or escape[; or]
- (j) any claim based on an act or failure to act to prevent or diminish the harmful consequences of a condition or situation, including the violent or tortious conduct of a third person, which is not originally caused by the public employer or any other person acting on behalf of the public employer.

Id. ch. 258 § 10.

⁵⁷ Shapiro v. City of Worcester, 982 N.E.2d 516, 524 (Mass. 2013).

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.* (citing Whitney v. Worcester, 373 Mass. 208, 217 (1977)).

⁶¹ *Id.* at 525.

⁶² No. 2011-01486, 2014 WL 841628, at *1 (Mass. Super. Ct. Jan. 15, 2014).

⁶³ *Id.* at *3.

⁶⁴ 310 MASS. CODE REGS. 15.003(3) (Westlaw 2018) (granting local authorities the right to “enact more stringent regulations to protect public health, safety, welfare and the environment”); see Tortorella v. Bd. of Health of Bourne, 655 N.E.2d 633, 636 (Mass. App. Ct. 1995).

⁶⁵ The MTCA does not waive sovereign immunity in relation to permitting decisions, so such decisions will not give rise to potential negligence claims. MASS. GEN. LAWS ANN. ch. 258, § 10(e) (Westlaw 2018).

⁶⁶ See Hersey v. Bd. of Health of City of Gloucester, No. CA 942722, 1995 WL 1312574, at *3-4 (Mass. Super. Ct. Aug. 29, 1995) (upholding the defendant-board’s denial of a variance for a septic system due to concerns for negative effects on water quality); Quinn v. Bd. of County Comm’rs for Queen Anne’s County, Maryland, 862 F.3d 433, 439-40 (4th Cir. 2017) (denying a takings claim when municipal laws resulted in plaintiff’s properties becoming ineligible for building permits because the soil conditions could not support septic systems).

⁶⁷ Twomey v. Commonwealth, 825 N.E.2d 989, 993 (Mass. 2005) (citing MASS. GEN. LAWS ch. 258, § 10(j)(3)).

⁶⁸ Canterbury Automotive, Inc. v. City of Worcester, No. 2011-01486, 2014 WL 841628, at *2 (Mass. Super. Ct. Jan. 15, 2014). However, as the effects of climate change expand, plaintiffs are pushing the boundaries of this area of law. Farmers Insurance Group filed class actions against nearly two-hundred Chicago-area municipalities after extensive flooding in 2013, alleging that the municipalities had failed to plan for foreseeable flooding. Farmers dropped the suit however, stating that their goal was to raise awareness of climate change risks. Robert McCoppin, *Insurance Company Drops Suits Over Chicago-area Flooding*, CHICAGO TRIBUNE (June 3, 2014, 6:52 PM), <https://www.chicagotribune.com/news/local/breaking/chi-chicago-flooding-insurance-lawsuit-20140603-story.html>. It is unclear whether a Massachusetts court would hold that a case of this nature would fall under the discretionary function exception in the MTCA.

⁶⁹ Canterbury Automotive, Inc., 2014 WL 841628, at *2 (holding that the discretionary functions exception of the MTCA does not entitle a municipality to sovereign immunity for allegations of deficient maintenance of infrastructure).