Attachment 4:

No Discharges from MassDOT Outfalls Assessments

Attachment 4 includes 36 assessments of water bodies where desktop review or field review of the subwatershed found that MassDOT-owned roads in the urban area do not drain to the receiving water in question and therefore, according to BMP 7U and 7R, no further assessment is necessary.

List of Impaired Water Bodies

MA32055	Pequot Pond*
MA35008	Bourn-Hadley Pond*
MA35083	Stoddard Pond*
MA36-06	Ware River*
MA36-22	Chicopee River*
MA41001	Alum Pond*
MA42019	Granite Reservoir*
MA42-07	Burncoat Brook*
MA42-15	Sucker Brook*
MA42-18	Grindstone Brook*
MA51047	Fish Pond*
MA52006	Central Pond*
MA52022	James V. Turner Reservoir*
MA70-05	Quincy Bay*
MA71-13	Unnamed Tributary*
MA73012	Memorial Pond*
MA81008	Bartlett Pond*
MA81-61	Unnamed Tributary*
MA84B-07	Tadmuck Brook*
MA92-22	Labor In Vain Creek*
MA93-56	Salem Sound*
MA94007	Billington Sea
MA94032	Crossman Pond
MA94038	Foundry Pond
MA94-10	Green Harbor River
MA94-12	Jones River
MA94-13	Jones River
MA94132	Russell Millpond
MA95033	Crane Brook Bog Pond
MA95146	Tihonet Pond
MA95-06	Sippican River*
MA95-41	East Branch Westport River*
MA96115	Great Pond
MA96183	Long Pond
MA96288	Shawme Lake*
MA96326	Upper Shawme Lake*

*Not on Appendix L-1 list.

Impaired Waters Assessment for Pequot Pond (MA32055)

Summary

Impaired Water[1]	Impairments:	Stormwater:	*Dissolved Oxygen, Total Phosphorus*
		Non-Stormwater:[2]	*Non-Native Aquatic Plants*
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Westfield River Watershed 2001 Water Quality Assessment Report*[3]	
Location	Towns:	*Southampton, Westfield*	
	MassDOT Roads:	*None*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Pequot Pond (MA32055) is a 155-acre pond located in Westfield and Southampton, Massachusetts. The pond is located east of Route 10 and US Route 202, north of Interstate 90 and west of Interstate 91. The total watershed and subwatershed for Pequot Pond are the same and are approximately 2.8 square miles. It is shown in Figure 1. Pequot Pond outlets to Horse Pond (MA32043) in Westfield.

MassDEP's *Westfield River Watershed 2001 Water Quality Assessment Report*[3] for Pequot Pond lists Aquatic Life as "impaired" due to non-native aquatic plants *(P. crispus, M. spicatum, and M. heterophyllum)*. Fish Consumption, Primary Contact, Secondary Contact, and Aesthetics are listed as "not assessed" for this waterbody. The EPA's *2012 Waterbody Report for Pequot Pond*[4] also lists Aquatic Life as "impaired." It lists the source of the dissolved oxygen and total phosphorus

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDOT, December 2012. Impaired Waters Assessment for Impaired Waters with Impairments Unrelated to Stormwater. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/impairedWaters/Year3/Year3_ImpairedWatersAssessment_1.pdf#page=308

[3] MassDEP, April 2005. Westfield River Watershed 2001 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/32wqar.pdf

[4] EPA, 2012, 2012 Waterbody Report for Pequot Pond, Available at: http://ofmpub.epa.gov/tmdl_waters10/attains_waterbody.control?p_au_id=MA32055&p_cycle=2012&p_state=MA&p_report_type=

impairments as “source unknown.” Land use within the watershed consists of low and medium-density residential, forest, crop land, and recreational areas.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Pequot Pond is not proposed to change.

After review of record plans and aerials it was determined that MassDOT property does not discharge to Pequot Pond. There are no MassDOT-owned roadways located within the total watershed to Pequot Pond. The closest MassDOT-owned urban roadway to Pequot Pond is Route 10 and it is located over 1-mile west of the pond and is outside of the ponds watershed. US Route 202 is located south of Pequot Pond but is a city-owned roadway at this location.

As defined in MassDOT's assessment methodology,[6] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Pequot Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

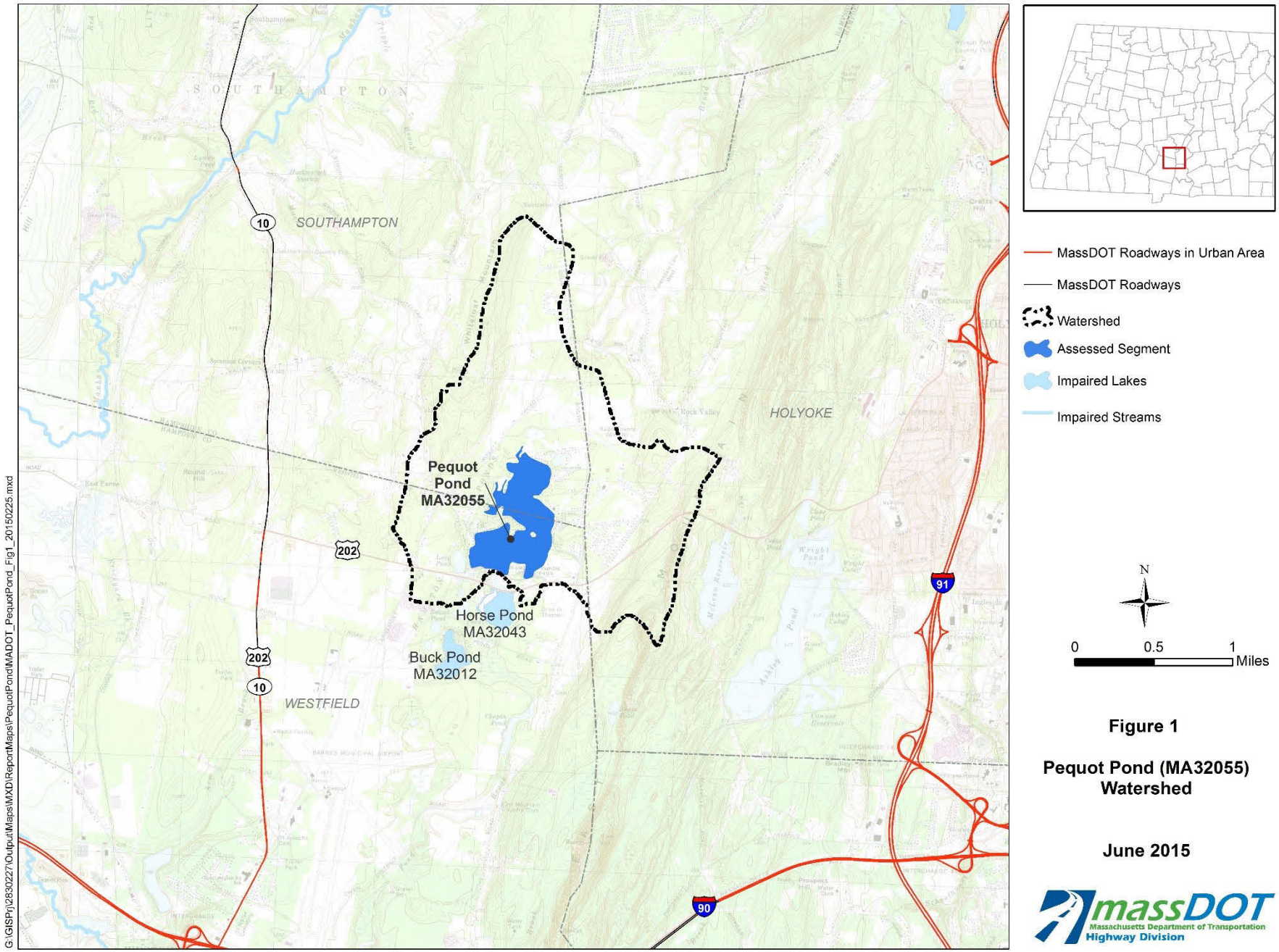

Figure 1

Pequot Pond (MA32055) Watershed

June 2015

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Highway Division

6/08/2015

Impaired Waters Assessment for Bourn-Hadley Pond (MA35008)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Plants (Macrophytes)*
	Category:	*4A (TMDL is completed)*
	Final TMDLs:	*Total Maximum Daily Loads of Phosphorus for Selected Millers Basin Lakes*[2]
	WQ Assessment:	*Millers River Watershed 2000 Water Quality Assessment Report*[3]
Location	Towns:	*Templeton*
	MassDOT Roads:	*Route 2, Route 2A, Route 202*
Assessment Method(s)	7R (TMDL Method) ☒	7U (Non-TMDL Method) ☐ No Discharge ☒

Site Description

Bourn-Hadley Pond (MA35008) is a 25.8-acre pond in Templeton, Massachusetts. Bourn-Hadley Pond is fed by Trout Brook on the west side of the pond and outlets to Trout Brook at the northern end of the pond. The pond is located south of Route 2A and east of the Route 2/Route 2A interchange. The total and subwatershed for Bourn-Hadley Pond are the same and is approximately 2.2 square miles. Both are shown in Figure 1. More than half the watershed area is comprised of forest. Other prominent land uses within the watershed include rural and agricultural land, water, and wetlands.

MassDEP's *Millers River Watershed 2000 Water Quality Assessment Report*[3] for Bourn-Hadley Pond lists Aquatic Life, Fish Consumption, Primary Contact, Secondary Contact, and Aesthetics as "not assessed", and states that Bourn-Hadley Pond is impaired because of noxious aquatic plants.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014*

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, May 2003. Total Maximum Daily Loads of Phosphorus for Selected Millers Basin Lakes. Available at: http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/millers.pdf

[3] MassDEP, March 2004. Millers River Watersheds 2000 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/35wqar.pdf

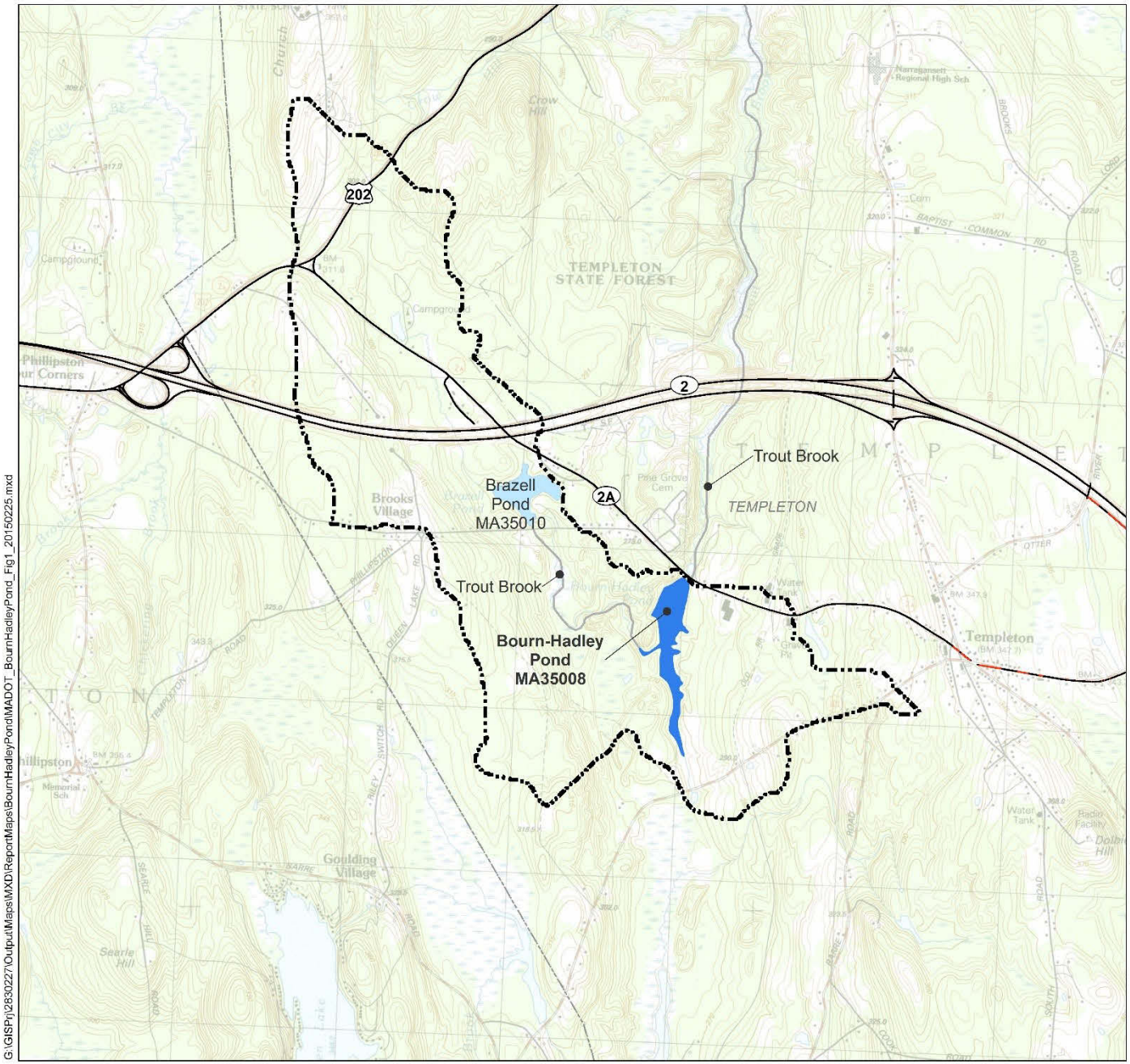
Integrated List of Waters, which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Bourn-Hadley Pond is not proposed to change.

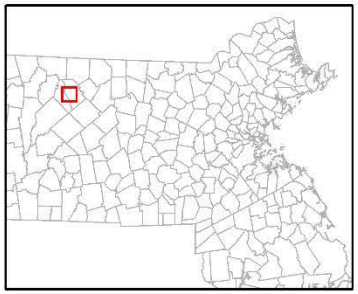
After review of record plans and aerials, it was determined that MassDOT property in urban area does not discharge to Bourn-Hadley Pond. MassDOT-owned Route 2, Route 2A, and Route 202 are located within the watershed to Bourn-Hadley Pond. Route 2A passes Bourn-Hadley Pond at the northern end of the pond where it outlets to Trout Brook. A site visit in March, 2015 confirmed that stormwater runoff from Route 2A directly discharges to Bourn-Hadley Pond immediately upstream of where it outlets to Trout Brook. However, this portion of Route 2A is not within an urban area regulated under the MS4 program.

As defined in MassDOT's assessment methodology, [5] since this portion of MassDOT's property is not in an urbanized area and is not regulated under the MS4 program, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] MassDOT, July 2010. BMP 7R: TMDL Watershed Review. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7R_TMDL_WatershedReview.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Watershed

Assessed Segment

Impaired Lakes

Non-Impaired Stream

N

0 0.25 0.5 Miles

Figure 1

Bourn-Hadley Pond (MA35008) Watershed

June 2015

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6/08/2015

Impaired Waters Assessment for Stoddard Pond (MA35083)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Plants (Macrophytes)*
	Category:	*4A (TMDL is completed)*
	Final TMDLs:	*Total Maximum Daily Loads of Phosphorus for Selected Millers Basin Lakes*[2]
	WQ Assessment:	*Millers River Watershed 2000 Water Quality Assessment Report*[3]
Location	Towns:	*Winchendon*
	MassDOT Roads:	*None*
Assessment Method(s)	7R (TMDL Method) ☒	7U (Non-TMDL Method) ☐ No Discharge ☒

Site Description

Stoddard Pond (MA35083) is a 51.8-acre pond in Winchendon, Massachusetts. Stoddard Pond is fed from the north by Beaman Brook and from the east by an unnamed stream. The pond outlets to Beaman Brook at the southern end of the pond. The pond is located east of Route 202 and north of Mill Glen Road. The total watershed and subwatershed for Stoddard Pond are the same. It is approximately 3.2 square miles and is shown in Figure 1. More than half the total watershed area is comprised of forest. Other prominent land uses within the watershed include rural and agricultural land, water, and wetlands.

MassDEP's *Millers River Watershed 2000 Water Quality Assessment Report*[3] for Stoddard Pond lists Aquatic Life, Fish Consumption, Primary Contact, Secondary Contact, and Aesthetics as "not assessed". However, the EPA's *2012 Waterbody Report for Stoddard Pond*[4] lists Aesthetics, Primary Contact and Secondary Contact as "impaired." The source of the impairment is listed as "source unknown."

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[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, May 2003. Total Maximum Daily Loads of Phosphorus for Selected Millers Basin Lakes. Available at: http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/millers.pdf

[3] MassDEP, March 2004. Millers River Watersheds 2000 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/35wqar.pdf

[4] EPA, 2012, 2012 Waterbody Report for Stoddard Pond, Available at: http://ofmpub.epa.gov/tmdl_waters10/attains_waterbody.control?p_au_id=MA35083&p_cycle=2012&p_state=MA&p_report_type=

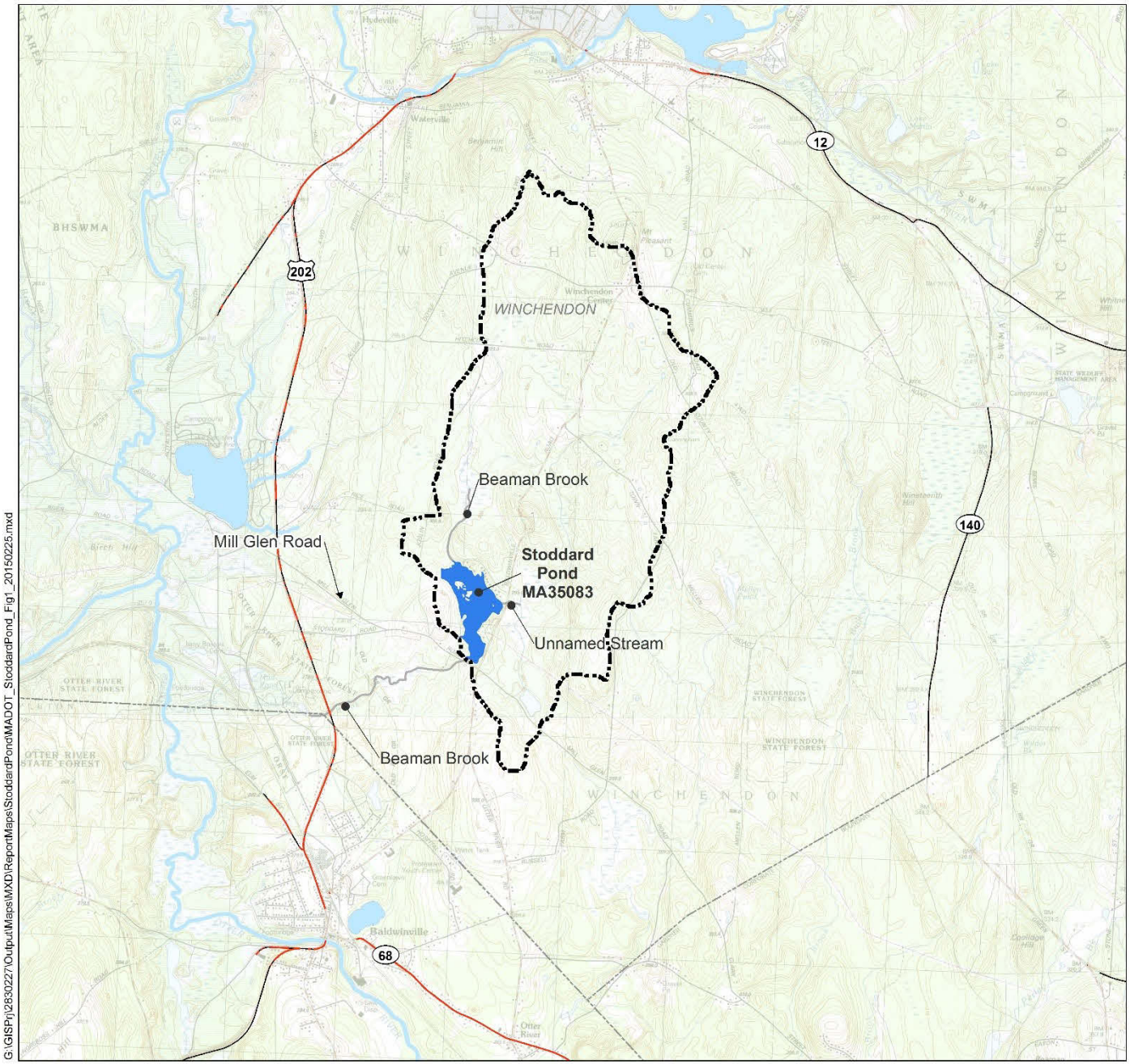
This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Stoddard Pond is not proposed to change.

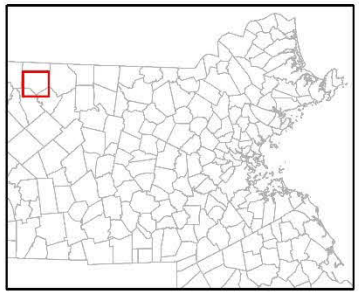
After a review of record plans and aerials, it was determined that MassDOT property does not discharge to Stoddard Pond. There are no MassDOT-owned roadways located within the total watershed to Stoddard Pond. The closest MassDOT-owned urban roadway to Stoddard Pond is Route 202 but it is located more than 1-mile west of the pond and is outside of the pond's watershed.

As defined in MassDOT's assessment methodology,[6] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Stoddard Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] MassDOT, July 2010. BMP 7R: TMDL Watershed Review. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7R_TMDL_WatershedReview.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Watershed

Assessed Segment

Impaired Lakes

Impaired Streams

Non-Impaired Stream

N

0 0.5 1 Miles

Figure 1

Stoddard Pond (MA35083) Watershed

June 2015

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Highway Division

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6/08/2015

Impaired Waters Assessment for Ware River (MA36-06)

Summary

Impaired Water[1]	Stormwater Impairments:	*Fecal Coliform*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*Chicopee River Watershed 2003 Water Quality Assessment Report*[2]
Location	Towns:	*Palmer, Ware*
	MassDOT Roads:	*Route 9, Route 32, Route 122, Route 122A*
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒

Site Description

The Ware River (MA36-06) is a 10.1-mile segment located in Ware and Palmer, Massachusetts. This segment of the Ware River starts at the Ware Dam in Ware and ends at the Thorndike Dam in Palmer (see Figure 1B). This segment of Ware River is located south of Route 9 and flows in a southerly direction, crossing Route 32 north of the Palmer town line, and ends north of Interstate 90. Ware River is classified as Class B because it is designated as a habitat for fish and is used for primary and secondary contact recreation. This segment is also a Warm Water Fishery with Combined Sewer Overflows (CSOs). According to the *Chicopee River Watershed 2003 Water Quality Assessment Report*[2] the CSO designation for this segment of the Ware River should be removed in future Massachusetts Surface Water Quality Standards since there are currently no CSOs in this segment. The total watershed is approximately 215 square miles and the subwatershed is approximately 19 square miles. Both are shown in Figure 1A. Land use within the subwatershed consists mostly of forest, open land and crop land. Other land uses within the subwatershed include low-density residential, mining, and water.

MassDEP's *Chicopee River Watershed 2003 Water Quality Assessment Report*[2] for Ware River lists Aquatic Life and Aesthetics as "support" because they meet surface water quality standards. Fish Consumption, Primary Contact, and Secondary Contact are listed as "not assessed" for this

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, October 2008. Chicopee River Watershed 2003 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/36wqar03.pdf

waterbody. Additionally, the EPA's *2012 Waterbody Report for Ware River*[3] lists Primary Contact as "impaired" with the source being listed as "source unknown."

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Ware River is not proposed to change.

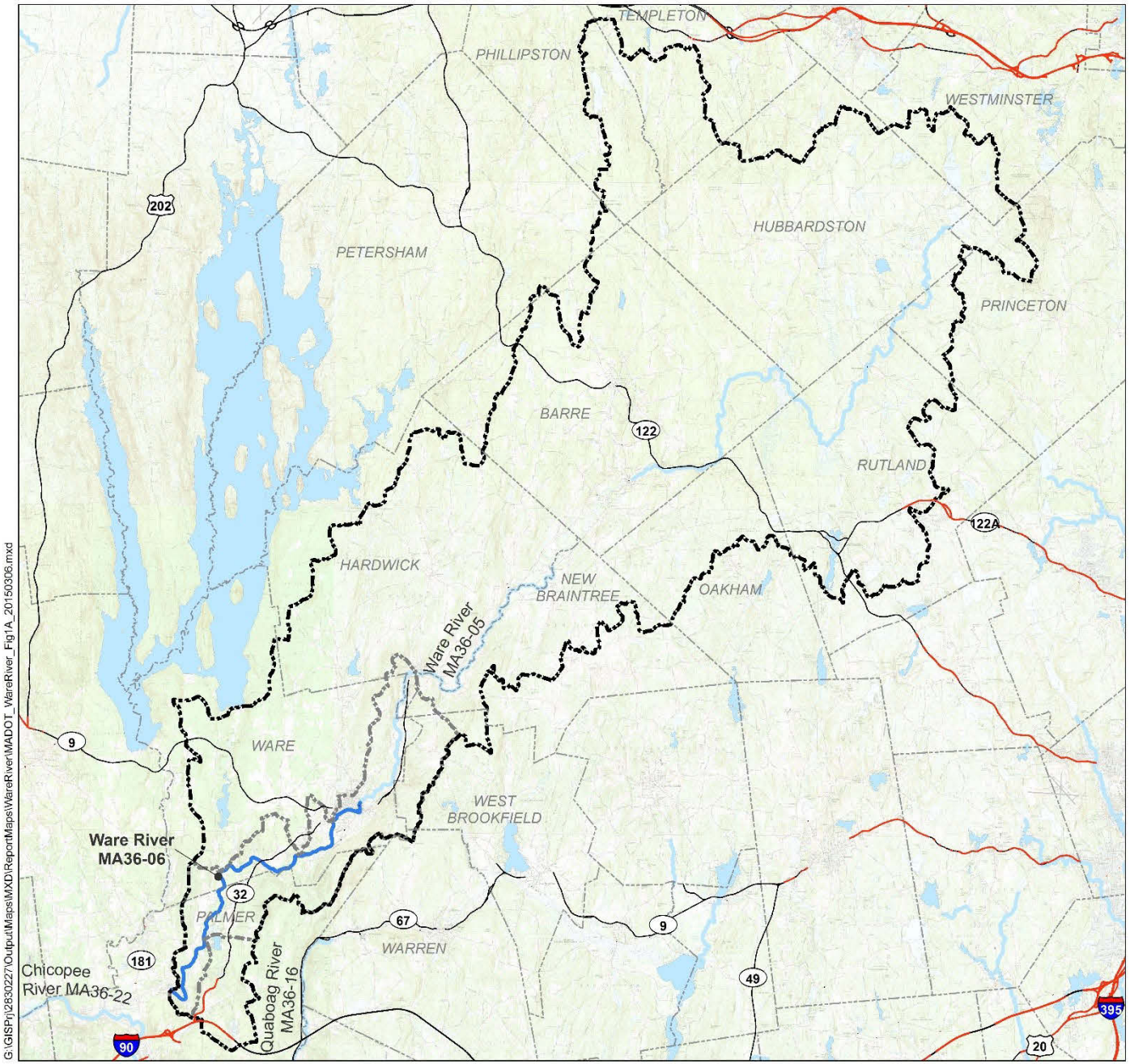
After review of aerials and record plans, it was determined that MassDOT property in urban area does not discharge to this segment of Ware River. MassDOT-owned Route 9, Route 32, Route 122, and Route 122A are located within the total watershed to Ware River. Route 32 and Route 9 are located within the subwatershed. A catch basin on Route 32 directly discharges to Ware River where it crosses the river just north of the Ware and Palmer Town Boundary. However, this portion of Route 32, as well as all MassDOT-owned roadways within the subwatershed, are not within an urban area regulated under the MS4 program.

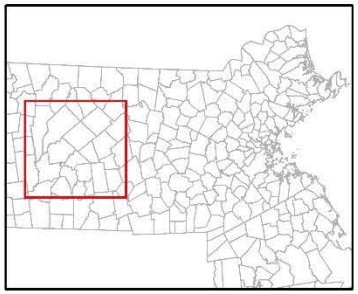
As defined in MassDOT's assessment methodology, [5] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Ware River, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] EPA, 2012, 2012 Waterbody Report for Ware River, Available at: http://ofmpub.epa.gov/tmdl_waters10/attains_waterbody.control?p_au_id=MA36-06&p_cycle=2012&p_state=MA&p_report_type=

[4] MassDOT, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Total Watershed

Subwatershed

Assessed Segment

Impaired Lakes

Impaired Streams

N

0 2 4 Miles

Figure 1A

Ware River (MA36-06) Watersheds

June 2015

massDOT Massachusetts Department of Transportation Highway Division

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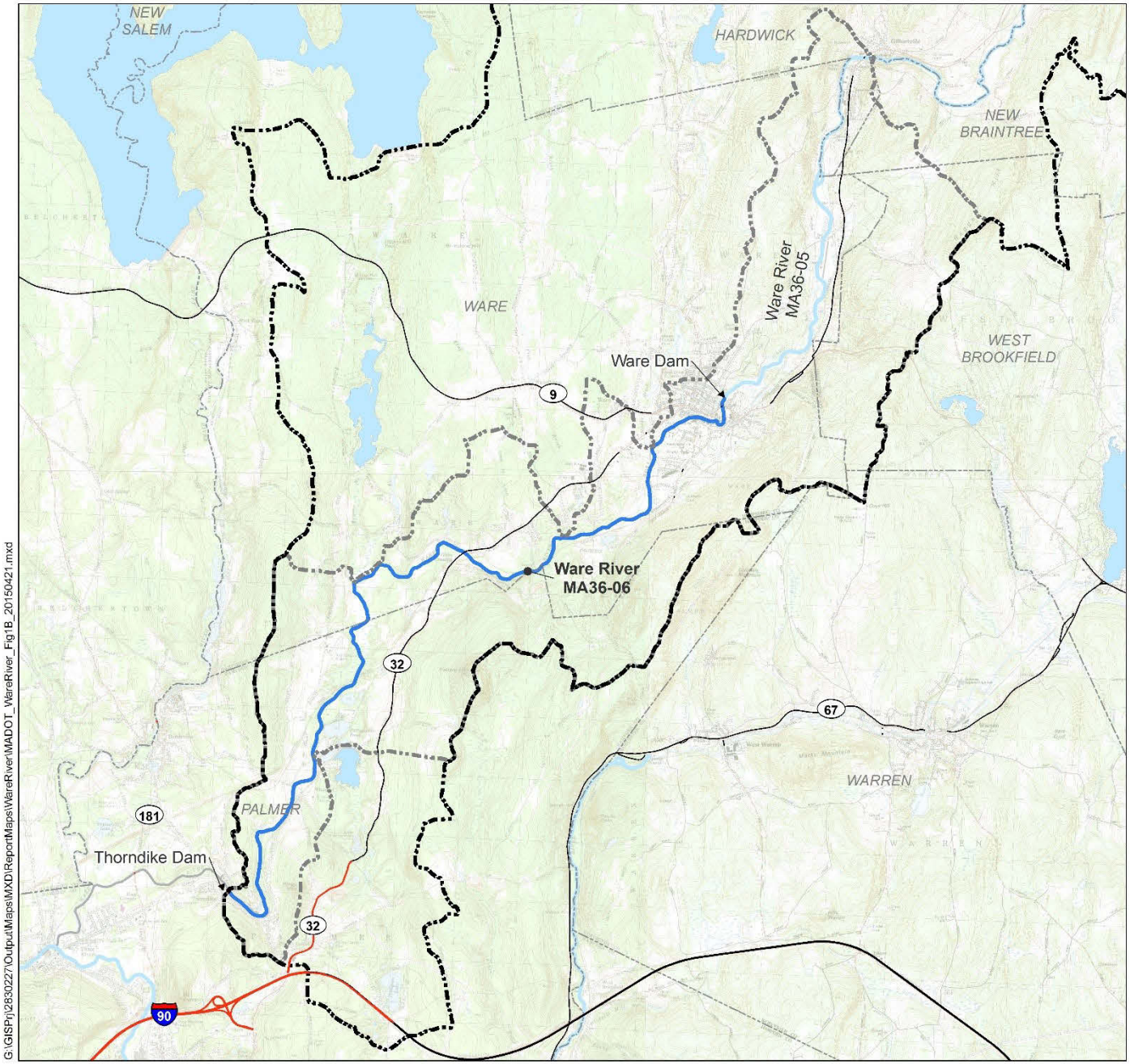

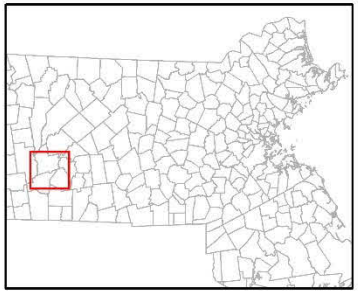

MassDOT Roadways in Urban Area
MassDOT Roadways
Total Watershed
Subwatershed
Assessed Segment
Impaired Lakes
Impaired Streams
Non-Impaired Stream

N

0 0.65 1.3 Miles

Figure 1B

Ware River (MA36-06) Subwatershed

June 2015

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6/08/2015

Impaired Waters Assessment for Chicopee River (MA36-22)

Summary

Impaired Water[1]	Impairments:	Stormwater:	*Escherichia coli*
		Non-Stormwater:[2]	*Mercury in Fish Tissue*
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Chicopee River Watershed 2003 Water Quality Assessment Report*[3]	
Location	Towns:	*Ludlow, Palmer, Wilbraham*	
	MassDOT Roads:	*Interstate 90, Route 9, US Route 20, Route 32, Route 49, Route 67, Route 122, Route 122A, Route 181, US Route 202*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Chicopee River (MA36-22) is a 2.8-mile segment located in Palmer, Ludlow, and Wilbraham, Massachusetts (see Figure 1A). This segment of the Chicopee River begins at the confluence of the Ware River (MA36-07) and Quaboag River (MA36-17) in Palmer and ends at the Red Bridge Impoundment Dam located at the Wilbraham/Ludlow town line (see Figure 1B). Segment MA36-22 includes Red Bridge Impoundment, formerly segment MA36171. This segment of the Chicopee River is located north of Interstate 90 and west of Route 181. The Chicopee River is classified as a Class B segment because it is designated as a habitat for fish and is used for primary and secondary contact recreation[3]. This segment is also classified as a Warm Water Fishery with Combined Sewer Overflows (CSOs). The total watershed is approximately 660 square miles and the subwatershed is approximately 17 square miles. The total and sub watersheds are shown in Figures 1A and 1B respectively. Land use within the subwatershed is comprised mostly of forested areas and crop lands. Other land uses within the subwatershed include low and medium-density residential areas, commercial areas and wetlands.

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDOT, December 2012. Impaired Waters Assessment for Impaired Waters with Impairments Unrelated to Stormwater. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/impairedWaters/Year3/Year3_ImpairedWatersAssessment_1.pdf#page=308

[3] MassDEP, October 2008. Chicopee River Watershed 2003 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/36wqar03.pdf

MassDEP's Water Quality Assessment Report[3] for Chicopee River lists Aquatic Life, Secondary Contact, and Aesthetics as "support" because they meet surface water quality standards. Primary Contact is listed as "impaired" due to elevated *Escherichia coli*. The assessment report lists the source of the impairment as being due to combined sewer overflows and suspected sources as illicit connections/hook-ups to storm sewers and unspecified urban stormwater. Fish Consumption was listed as "not assessed" for this waterbody.

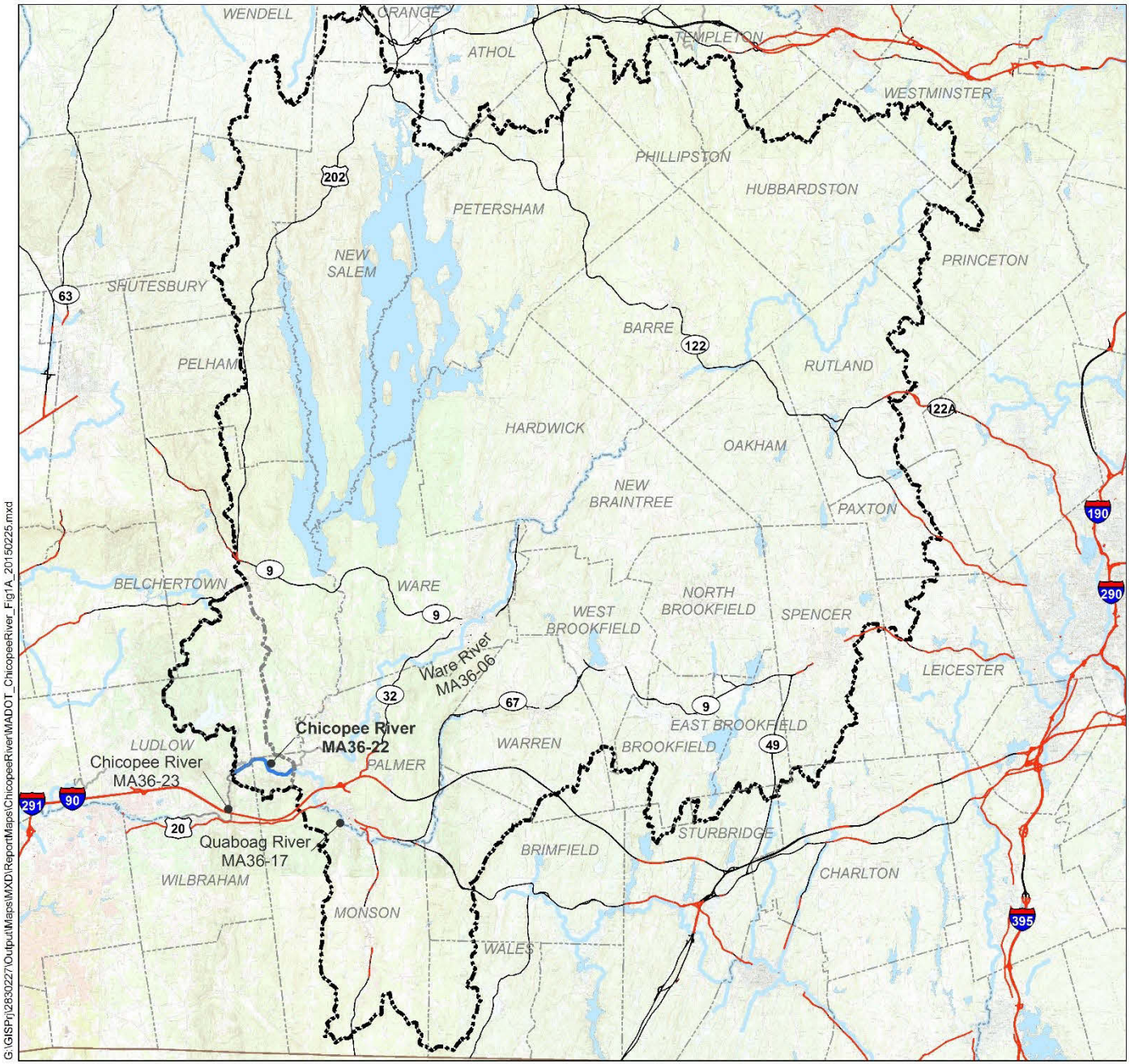
This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Chicopee River is not proposed to change.

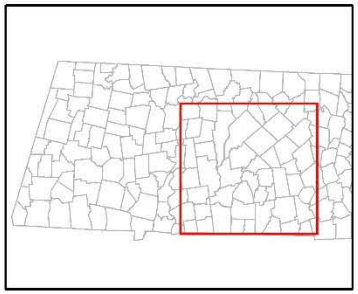
After review of record plans and aerials, it was determined that MassDOT property does not directly discharge to Chicopee River. There are no MassDOT-owned roadways located within the subwatershed to Chicopee River. Interstate 90 and US Route 20 are the closest MassDOT-owned roadways located within the total watershed to Chicopee River. However, both roadways are located more than one mile away from the river and do not directly discharge stormwater runoff to the river.

As defined in MassDOT's assessment methodology,[5] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Chicopee River, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





- MassDOT Roadways in Urban Area
- MassDOT Roadways
- Total Watershed
- Subwatershed
- Assessed Segment
- Impaired Lakes
- Impaired Streams
- Non-Impaired Stream
- Non-Impaired Lake

N

0 2.25 4.5 Miles

Figure 1A

Chicopee River (MA36-22) Watersheds

June 2015

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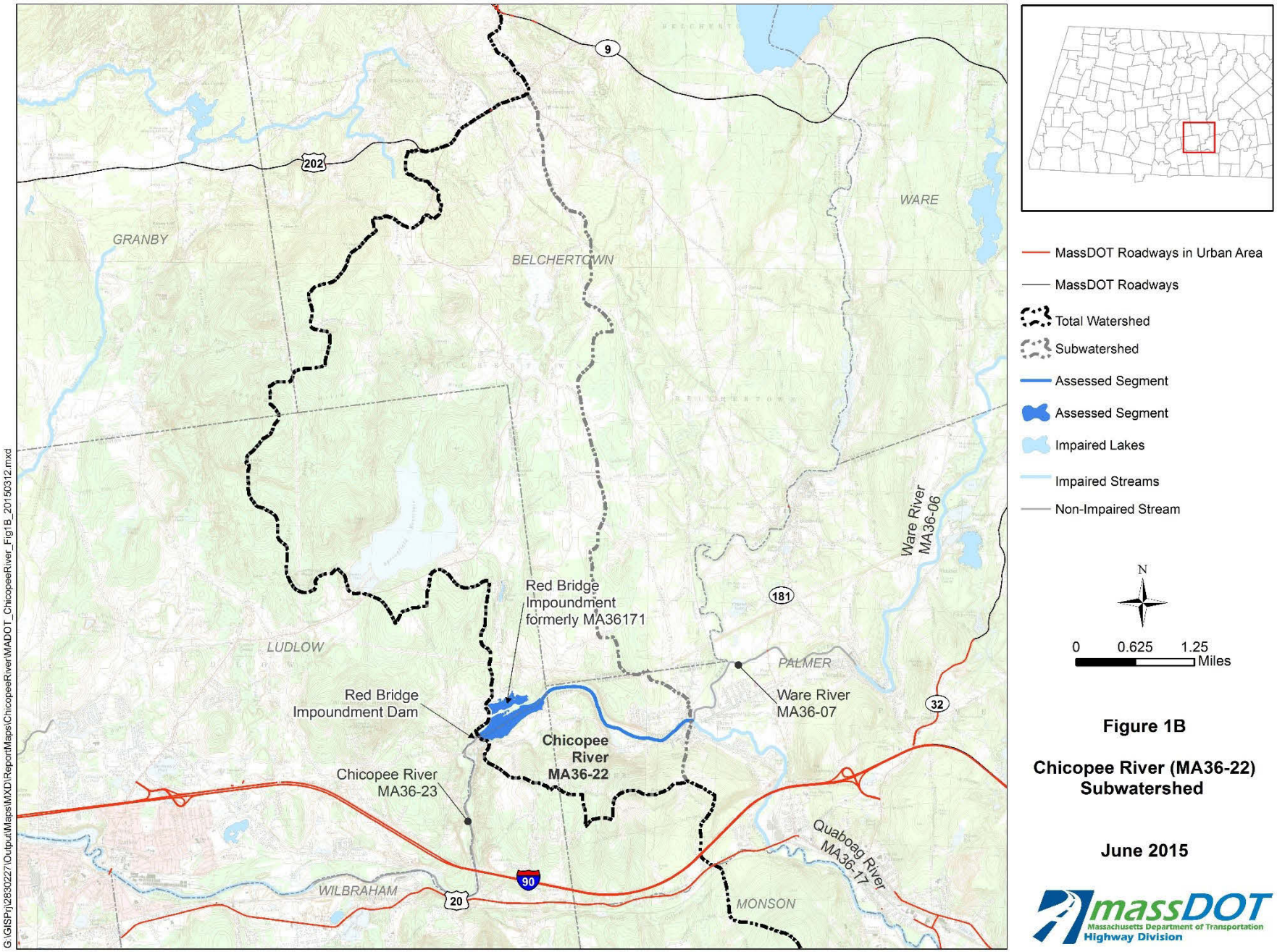

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Figure 1B

Chicopee River (MA36-22) Subwatershed

June 2015

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06/08/2015

Impaired Waters Assessment for Alum Pond (MA41001)

Summary

Impaired Water[1]	Stormwater Impairments:	*Dissolved Oxygen*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report* [2]	
Location	Towns:	*Sturbridge*	
	MassDOT Roads:	*Interstate 90*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Alum Pond (MA41001) is located north of Interstate 90 and east of Brookfield Road (Route 148) in northwest Sturbridge, Massachusetts (Figure 1). Alum Pond has a surface area of approximately 200 acres and receives flows at its northwestern tip from an unnamed stream. Flows exit the Alum Pond on its southwestern banks to East Brimfield Reservoir (MA41014) by way of an unnamed stream culverted under both Interstate 90 and Brookfield Road (Route 148).

MassDEP's *French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report*[2] identified the Aquatic Life use with an "impaired" status due to low dissolved oxygen levels. The Secondary Contact and Aesthetics uses were assessed as "support" due to the excellent Secchi depth measurements, low chlorophyll *a* concentrations and a lack of objectionable deposits. Fish Consumption use and Primary Contact use were "not assessed".

Figure 1 shows the total and subwatershed of Alum Pond, which are the same, totaling approximately 540 acres and are located in Sturbridge, Massachusetts. The watershed to Alum Pond is comprised of low and medium density residential with the majority of the watershed consisting of forested land, water and wetlands.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314*

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, November 2009. French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/4142wqar04.pdf

and 303(d) of the Clean Water Act.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Alum Pond is not proposed to change.

After review, it was determined that MassDOT property does not discharge to Alum Pond. This determination was made after a review of available record plans, aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned property is Interstate 90, which is 0.06 miles south and downstream of Alum Pond. Stormwater from Interstate 90 discharges to a series of ditches on the northern shoulder of the roadway. These ditches feed three separate culverts that direct stormwater to the southern shoulder of Interstate 90 where hydrologic connections east of Clark Road carry flows into the East Brimfield Reservoir (MA41014).

As defined in MassDOT's assessment methodology, [4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Alum Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

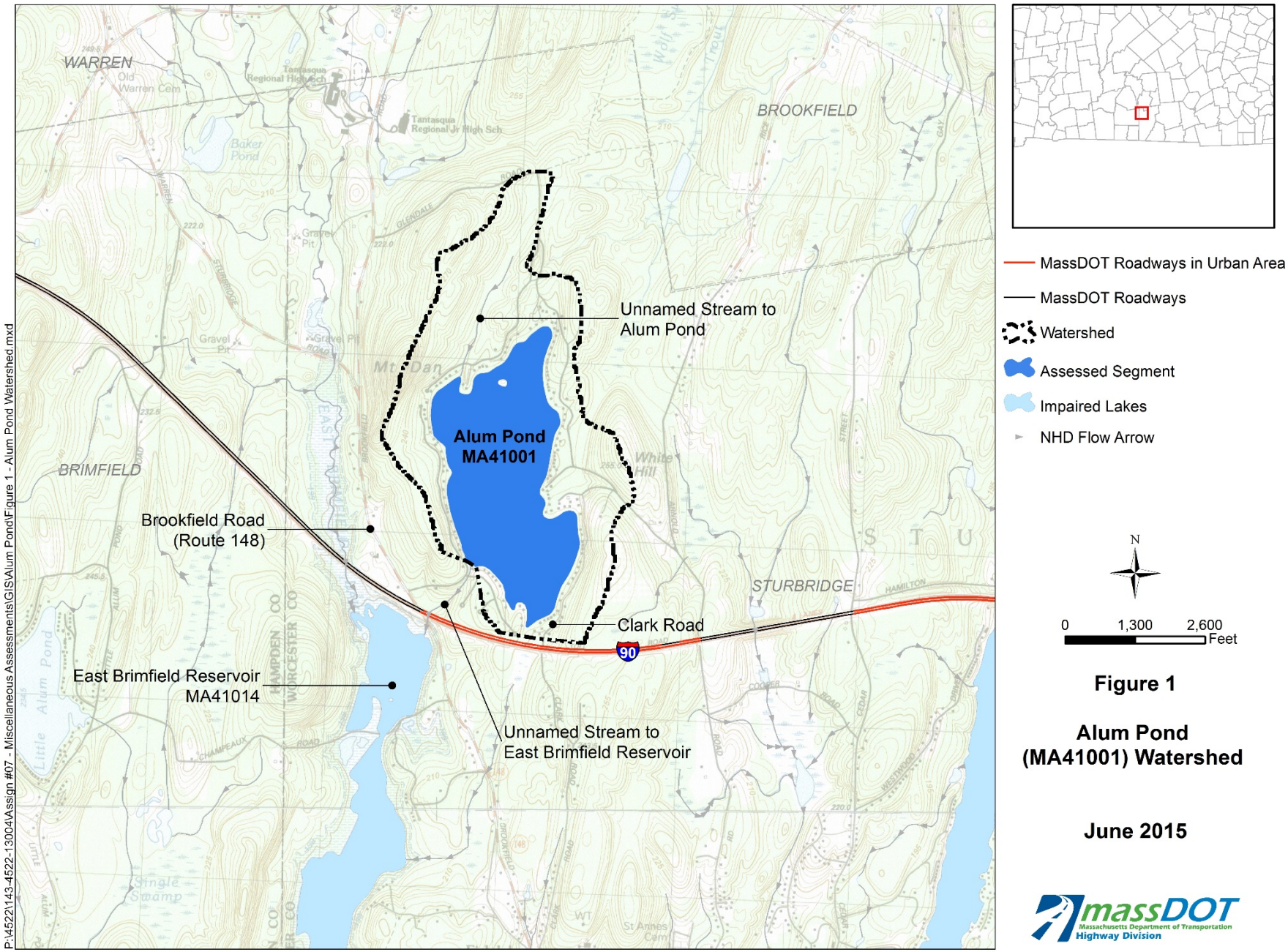

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Figure 1

Alum Pond (MA41001) Watershed

June 2015

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06/08/2015

Impaired Waters Assessment for Granite Reservoir (MA42019)

Summary

Impaired Water[1]	Impairments:	Stormwater:	*Aquatic Plants (Macrophyte)*
		Non-Stormwater:[2]	*Non-Native Aquatic Plants*
	Category:	*4A (TMDL is completed)*	
	Final TMDLs:	*Total Maximum Daily Loads of Phosphorus for Selected French Basin Lakes* [3]	
	WQ Assessment:	*French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report* [4]	
Location	Towns:	*Charlton*	
	MassDOT Roads:	*Route 20*	
Assessment Method(s)	7R (TMDL Method) ☒	7U (Non-TMDL Method) ☐	No Discharge ☒

Site Description

Granite Reservoir (MA42109) has a surface are of approximately 210 acres and is located in southeast Charlton, Massachusetts (Figure 1). Granite Reservoir receives flows from Shepherd Pond (MA42051) by way of an unnamed stream at its southern tip and a second unnamed stream at its northwestern tip. Flows exit Granite Reservoir via an unnamed stream into Unnamed Tributary (MA42-20) before reaching Buffumville Lake (MA42005) by way of South Fork Little River.

MassDEP's *French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report*[4] identified the Aquatic Life use with an "impaired" status due to the presence of non-native macrophyte species. All other uses were "not assessed".

Figure 1 shows the total and subwatershed of Granite Reservoir, which are the same, totaling approximately 7.9 square miles and are located in the towns of Charlton and Dudley, Massachusetts.

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[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDOT, December 2012. Impaired Waters Assessment for Impaired Waters with Impairments Unrelated to Stormwater. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/impairedWaters/Year3/Year3_ImpairedWatersAssessment_1.pdf#page=308

[3] MassDEP, May 2002. Total Maximum Daily Loads of Phosphorus for Selected French Basin Lakes. Available at: http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/french.pdf

[4] MassDEP, November 2009. French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/4142wqar04.pdf

The watershed to Granite Reservoir is comprised of water, wetlands, agricultural and rural land with the majority of the watershed consisting of forested land.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*[1]. MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Granite Reservoir is not proposed to change.

After review, it was determined that MassDOT property does not discharge to Granite Reservoir. This determination was based on a review of aerials, hydrographic data and watershed mapping. A 1-mile section of Route 20 in Charlton runs through the northern section of the watershed, approximately 2.6 miles away from the waterbody. The runoff from this portion of Route 20 discharges to upland areas, wetland systems or an unnamed stream and therefore does not directly discharge to Granite Reservoir. Also, it should be noted that only a small portion of the MassDOT-owned roadway is within an MS4-regulated urban area.

As defined in MassDOT's assessment methodology, [6] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Granite Reservoir, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[5]MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6]MassDOT, July 2010. BMP 7R: TMDL Watershed Review. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7R_TMDL_WatershedReview.pdf

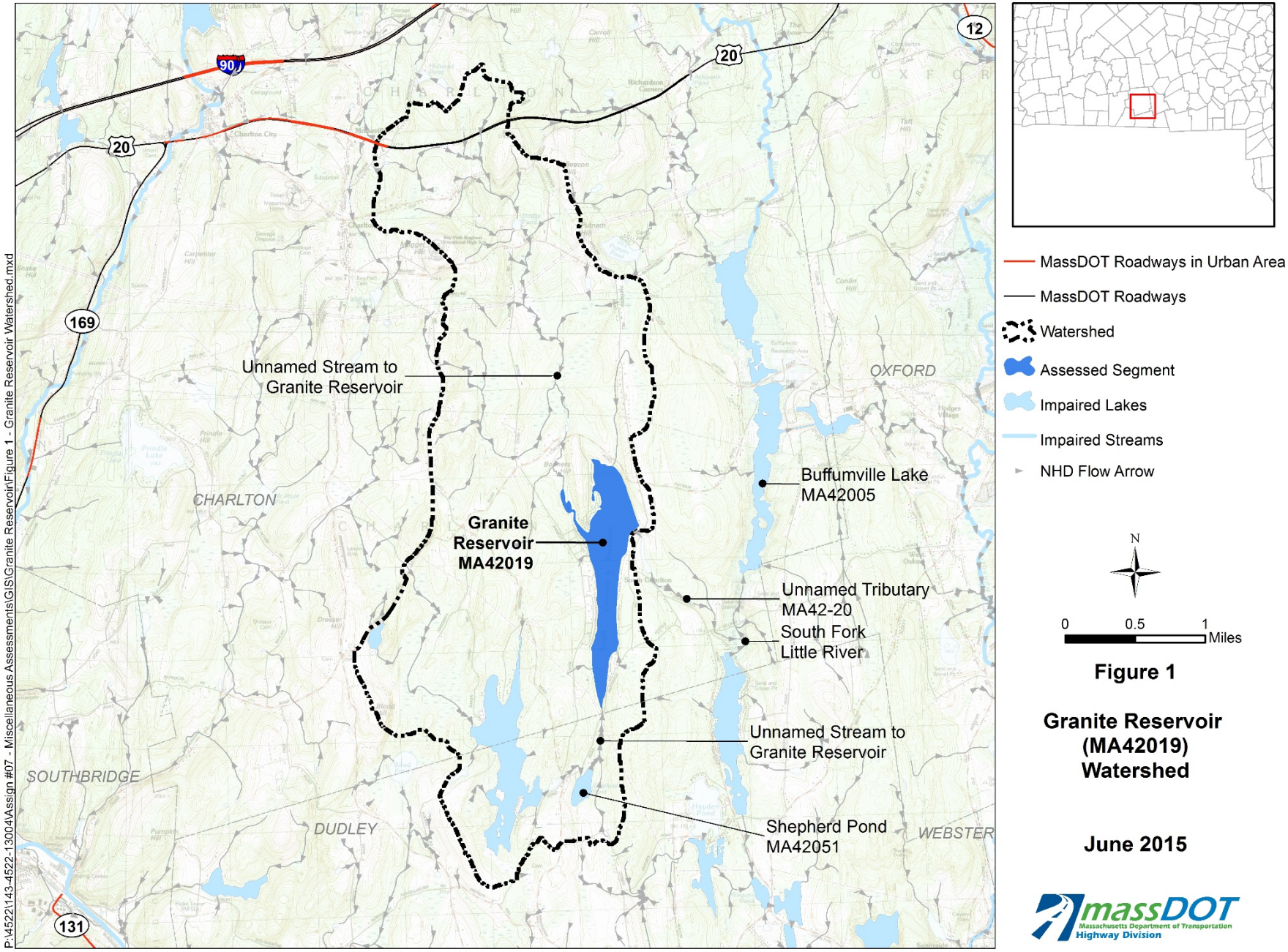

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Figure 1

Granite Reservoir (MA42019) Watershed

June 2015

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06/08/2015

Impaired Waters Assessment for Burncoat Brook (MA42-07)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Macroinvertebrate Bioassessments, Escherichia coli*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*French & Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report* [2]	
Location	Towns:	*Leicester*	
	MassDOT Roads:	*Route 9*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Burncoat Brook (MA42-07) originates at the outlet of Bouchard Pond (MA42003) and flows east for approximately 1.0 mile through former pond segment Ballard Hill Pond to its confluence with Town Meadow Brook in Leicester, Massachusetts (Figure 1).

MassDEP's *French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report*[2] identified the Aquatic Life use with an "impaired" status due to aquatic macroinvertebrate bioassesments. High Escherichia coli measurements is the cause of an "impaired" status for the Primary Contact use. The Escherichia coli measurements met the criteria for Secondary Contact use so this use has a "support" status. The suspected source of these impairments is due to active pastures with unrestricted cattle access in the watershed, as well as other upstream impoundments. The Aesthetics use is identified as "support" due to lack of instream objectionable deposits and objectionable conditions (lack of water color, foam and smell). Fish Consumption Use was "not assessed".

Figure 1 shows the total and subwatershed of Burncoat Brook, which are the same, totaling approximately 4.5 square miles and are located in the towns of Leicester and Spencer, Massachusetts. The watershed to Burncoat Brook is comprised of low density residential areas, pastures, cropland and wetlands with the majority of the watershed consisting of forested land.

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, November 2009. French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/4142wqar04.pdf

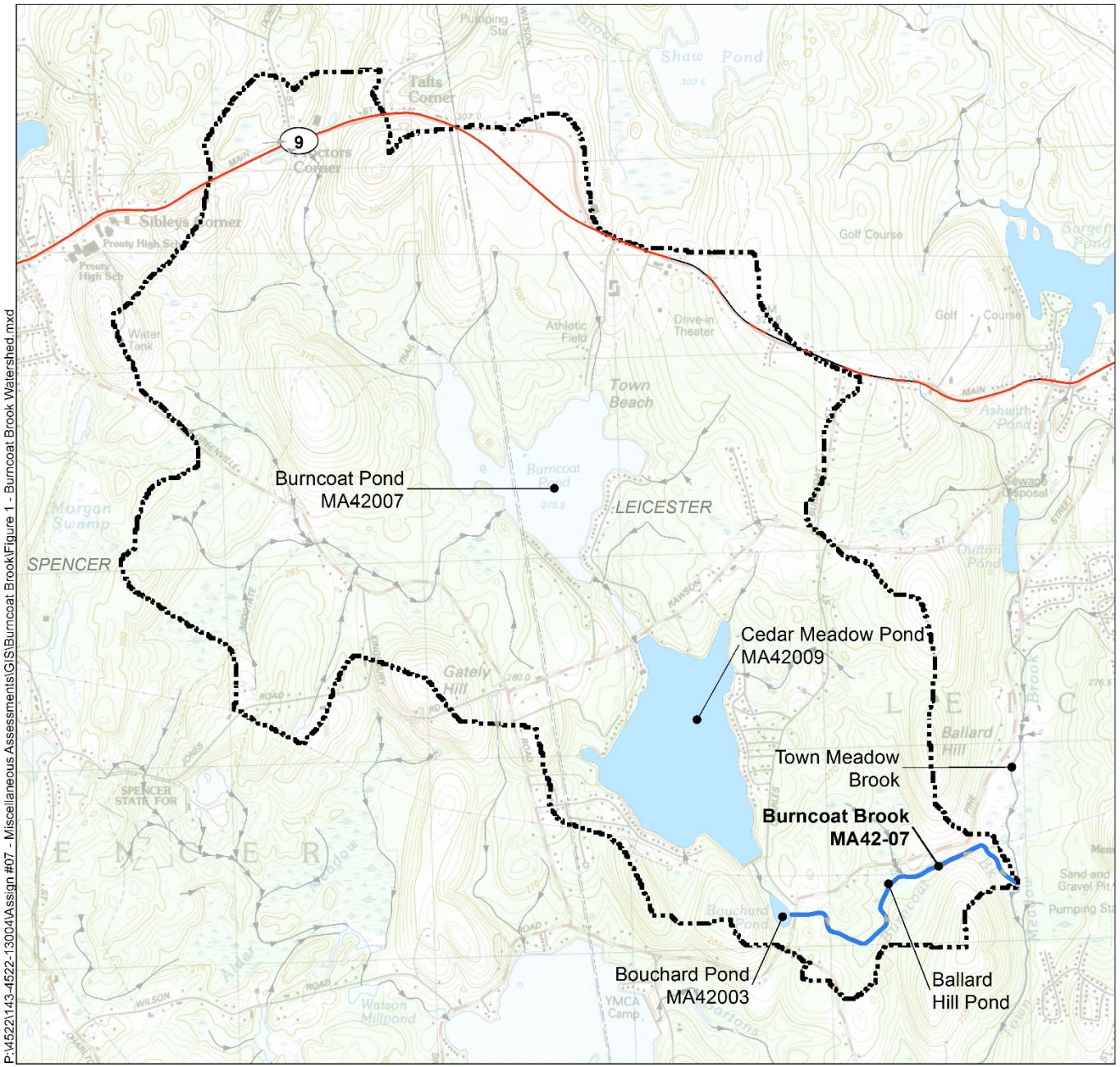
This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Burncoat Brook is not proposed to change.

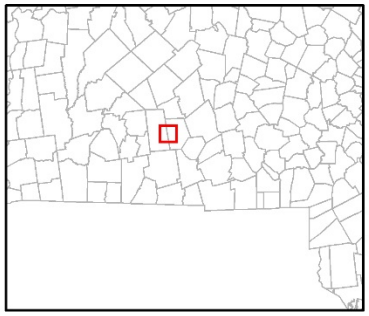
After review, it was determined that MassDOT property does not discharge to Burncoat Brook. This determination was based on a review of aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned properties to Burncoat Brook are Route 9 (1.4 miles north) and Interstate 90 (3.0 miles south). The section of Route 9 in Leicester and Spencer runs through the northern portion of the watershed. The runoff from this portion of Route 9 discharges to upland areas, wetland systems or other stream segments. Flows are then conveyed through Burncoat Pond (MA42007), Cedar Meadow Pond (MA42009) and Bouchard Pond (MA42003) before reaching Burncoat Brook.

As defined in MassDOT's assessment methodology,[4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Burncoat Brook, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Watershed

Assessed Segment

Impaired Lakes

NHD Flow Arrow

N

0 1,300 2,600 Feet

Figure 1

Burncoat Brook (MA42-07) Watershed

June 2015

MassDOT Massachusetts Department of Transportation Highway Division

06/08/2015

Impaired Waters Assessment for Sucker Brook (MA42-15)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Macroinvertebrate Bioassessments, Escherichia coli*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report*[2]	
Location	Towns:	*Webster*	
	MassDOT Roads:	*None*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Sucker Brook (MA42-15) originates at the outlet of Nipmuck Pond (MA42039) and flows southwest for approximately 1.7 miles to its inlet at Club Pond in Webster, Massachusetts (Figure 1).

MassDEP's *French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report*[2] identified the Aquatic Life use with an "impaired" status due to low flow alterations, limited riparian vegetative zone, scarcity of fish found during sampling and low pH measurements of the water during sampling. The Primary Contact use was also identified with an "impaired" status due to elevated Eschericia coli counts encountered during sampling. The Secondary Contact and Aesthetics uses have been assessed as "support", while the Fish Consumption use was "not assessed".

Figure 1 shows the total watershed and subwatershed of Sucker Brook, which are the same, totaling approximately 2.6 square miles and are located in the towns of Douglas, Oxford and Webster, Massachusetts. The watershed to Sucker Brook is comprised of low and medium density residential area, industrial areas, waters and wetlands with the majority of the watershed consisting of forested land.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014*

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, November 2009. French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/4142wqar04.pdf

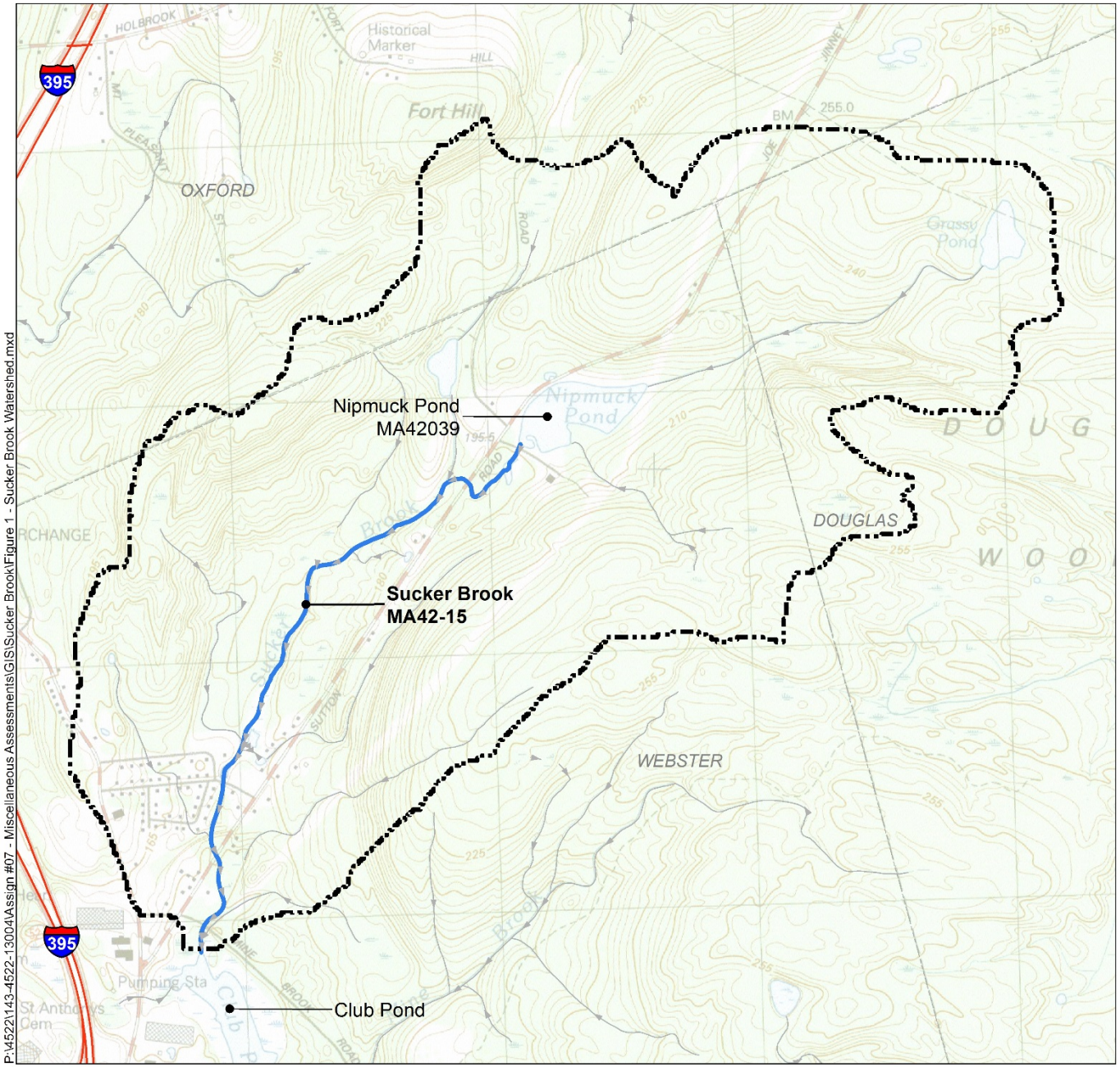
Integrated List of Waters, which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Sucker Brook is not proposed to change.

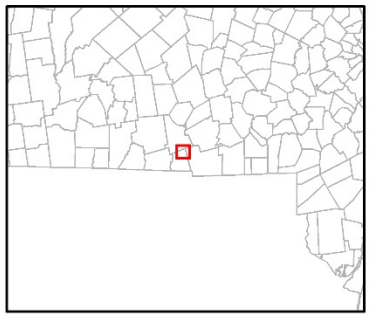
After review, it was determined that MassDOT property does not discharge to Sucker Brook. This determination was based on a review of aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned property is Interstate 395, which is 0.3 miles west of Sucker Brook. The section of Interstate 395 in Webster is outside of the northwest and southwest sections of the watershed. The runoff from this portion of Interstate 395 discharges to upland areas, wetland systems or stream segments downstream of Sucker Brook.

As defined in MassDOT's assessment methodology,[4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Sucker Brook, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Watershed

Assessed Segment

NHD Flow Arrow

N

0 1,000 2,000 Feet

Figure 1

Sucker Brook (MA42-15) Watershed

June 2015

MassDOT Massachusetts Department of Transportation Highway Division

06/08/2015

Impaired Waters Assessment for Grindstone Brook (MA42-18)

Summary

Impaired Water[1]	Stormwater Impairments:	*Escherichia coli*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report*[2]	
Location	Towns:	*Leicester*	
	MassDOT Roads:	*Route 9*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Grindstone Brook (MA42-18) originates at the outlet of Henshaw Pond (MA42025) and flows south for approximately 2.3 miles to its inlet at Rochdale Pond (MA42048) in Leicester, Massachusetts (Figure 1).

MassDEP's *French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report*[2] identified the Primary Contact uses as "impaired" due to a high geometric mean of *Escherichia coli* counts. The *Escherichia coli* count meets the criteria for Secondary Contact so this use has a "support" status. Due to the lack of instream objectionable deposits and conditions, the Aesthetics use was classified as "support". The Aquatic Life use was assessed as "alert" due to the low abundance of fish and general lack of fluvial fish found during sampling, and the Fish Consumption use was "not assessed".

Figure 1 shows the total watershed and subwatershed of Grindstone Brook, which are the same, totaling approximately 3.0 square miles and are located in the town Leicester, Massachusetts. The watershed to Grindstone Brook is comprised of low and medium density residential area, cropland, waters and wetlands with the majority of the watershed consisting of forested land.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014*

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, November 2009. French and Quinebaug River Watersheds 2004-2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/4142wqar04.pdf

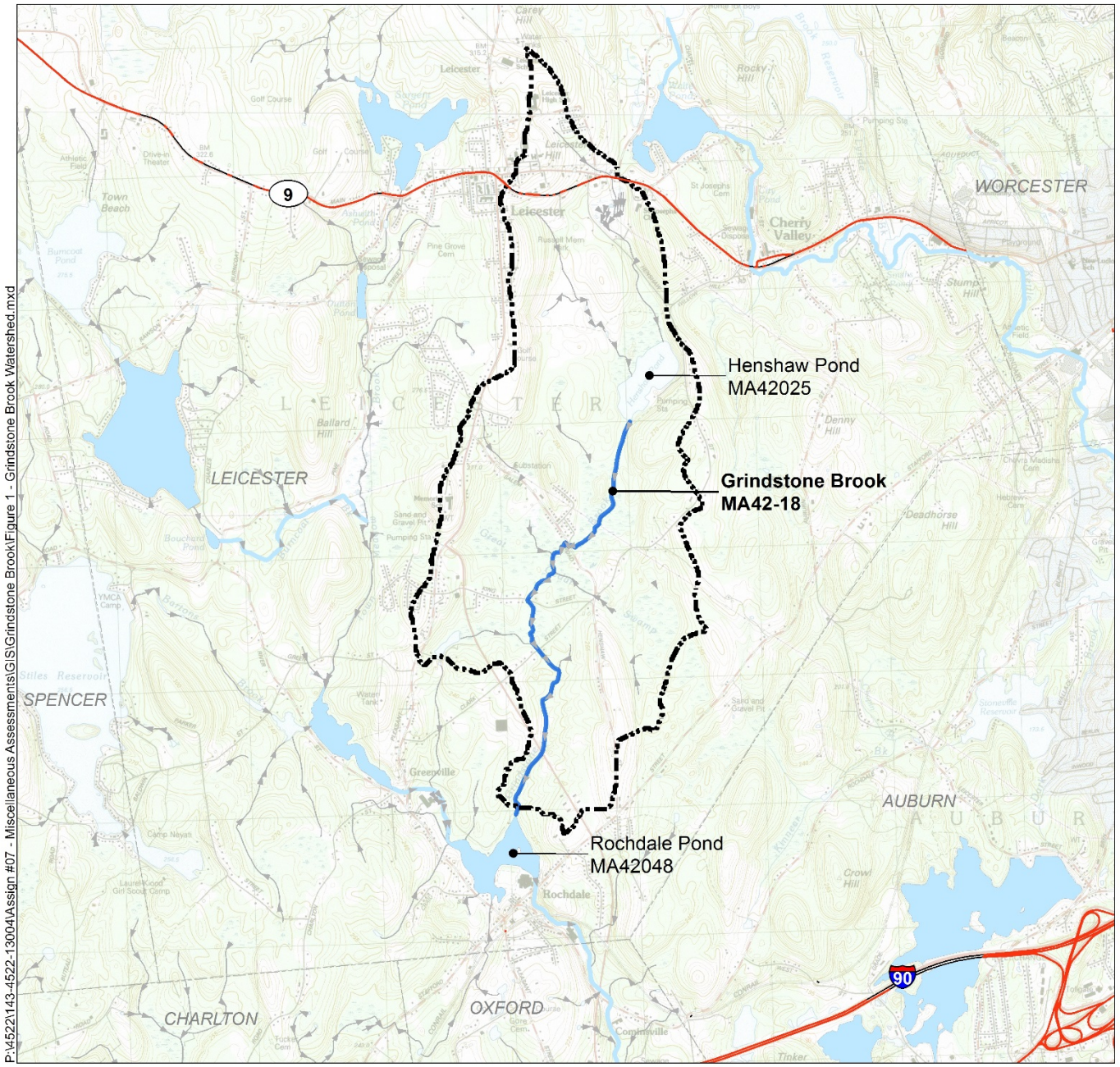
Integrated List of Waters, which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Grindstone Brook is not proposed to change.

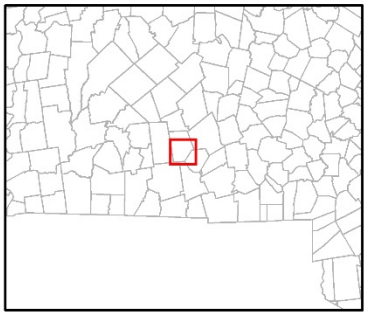
After review, it was determined that MassDOT property does not discharge to Grindstone Brook. This determination was based on a review of aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned properties to Grindstone Brook are Route 9 (1.0 mile north) and Interstate 90 (1.4 miles south). The section of Route 9 in Leicester run through the northern portion of the watershed. The runoff from this portion of Route 9 discharges to upland areas, wetland systems or other stream segments. Flows are then conveyed through Henshaw Pond (MA42025) before reaching Grindstone Brook.

As defined in MassDOT's assessment methodology,[4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Grindstone Brook, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area
MassDOT Roadways
Watershed
Assessed Segment
Impaired Lakes
Impaired Streams
NHD Flow Arrow

N

0 2,000 4,000 Feet

Figure 1

Grindstone Brook (MA42-18) Watershed

June 2015

massDOT
Massachusetts Department of Transportation
Highway Division

P:\4522\1143-4522-13004\Assign #07 - Miscellaneous Assessments\GIS\Grindstone Brook\Figure 1 - Grindstone Brook Watershed.mxd

massDOT Massachusetts Department of Transportation Highway Division

06/08/2015

Impaired Waters Assessment for Fish Pond (MA51047)

Summary

Impaired Water[1]	Impairments:	Stormwater:	*Aquatic Plants (Macrophytes)*
		Non-Stormwater:[2]	*Non-Native Aquatic Plants*
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Blackstone River Watershed 2003-2007 Water Quality Assessment Report*[3]	
Location	Towns:	*Northbridge*	
	MassDOT Roads:	*Route 146*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Fish Pond (MA51047) is located east of the Northbridge and Sutton town line and north of Purgatory Road in Northbridge, Massachusetts (Figure 1). Fish Pond has a surface area of approximately 8 acres and receives flows at its northern most point from Carpenter Reservoir via an unnamed stream. Flows exit Fish Pond on its southern bank to Whitins Pond (MA51180) by way of an unnamed stream culverted under Purgatory Road.

MassDEP's *Blackstone River Watershed 2003-2007 Water Quality Assessment Report*[3] identified the Aquatic Life use with an "impaired" status due to infestations of two non-native aquatic plants, *Myriophyllum heterophyllum* and *Cabomba caroliniana*. All other uses were "not assessed".

Figure 1 shows the total watershed and subwatershed of Fish Pond, which are the same, totaling approximately 5.8 square miles and are located in the towns of Northbridge and Sutton, Massachusetts. The watershed to Fish Pond is comprised of low and very low density residential areas, cropland, pastures, water and wetlands with the majority of the watershed consisting of forested land.

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDOT, December 2012. Impaired Waters Assessment for Impaired Waters with Impairments Unrelated to Stormwater. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/impairedWaters/Year3/Year3_ImpairedWatersAssessment_1.pdf#page=308

[3] MassDEP, March 2010. Blackstone River Watershed 2003-2007 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/51wqar10.pdf

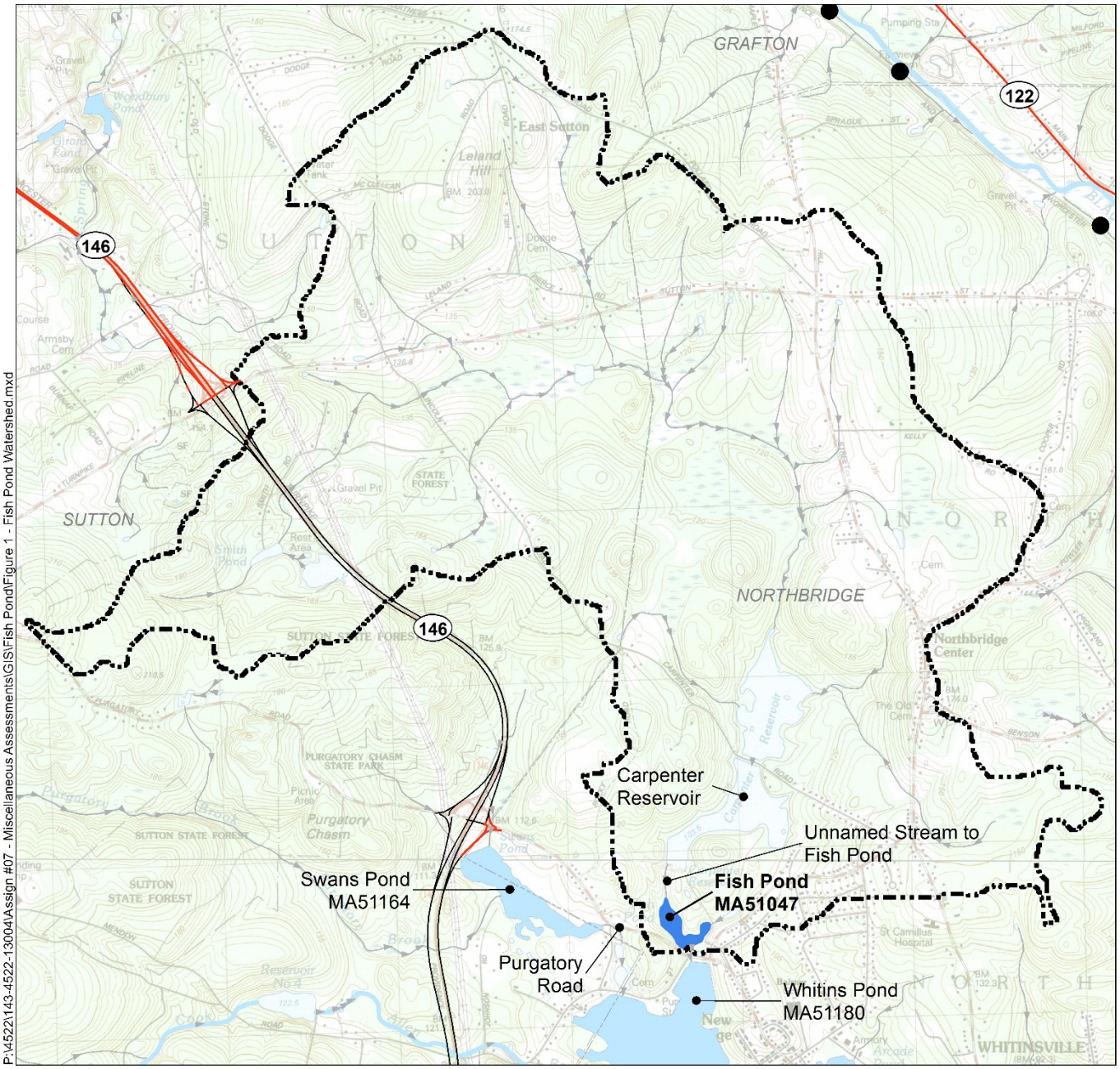
This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Fish Pond is not proposed to change.

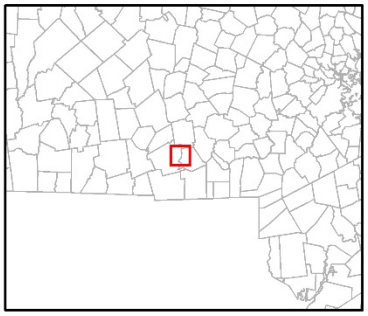
After review, it was determined that MassDOT property does not discharge to Fish Pond. This determination was made after a review of available record plans, aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned property is Route 146, which is 0.8 miles west of Fish Pond. A portion of Route 146 runs through the northwestern portion of the Fish Pond watershed. Stormwater from Route 146 within the Fish Pond watershed is discharged to an extensive upstream wetland system which carries flows approximately 2.9 miles before entering Carpenter Reservoir upstream of Fish Pond. It should also be noted that the portion of Route 146 within the watershed is outside of the MS4-regulated urban area.

As defined in MassDOT's assessment methodology, [5] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Fish Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area
MassDOT Roadways
Watershed
Assessed Segment
Impaired Lakes
Impaired Streams
NHD Flow Arrow

N

0 1,500 3,000 Feet

Figure 1

Fish Pond (MA51047) Watershed

June 2015

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6/08/2015

Impaired Waters Assessment for Central Pond (MA52006)

Summary

Impaired Waters[1]	Stormwater Impairments:	*Aquatic Plants (Macrophytes),Dissolved Oxygen Saturation, Excess Algal Growth, Organic Enrichment (Sewage) Biological Indicators, Dissolved Oxygen, Phosphorus (Total)*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*Ten Mile River Watershed 2002 Water Quality Assessment Report*[2]
Location	Towns:	*Seekonk*
	MassDOT Roads:	*None*
Assessment Method(s)	7R (TMDL Method) ☐	7U (IC Method) ☒ No Discharge ☒

Site Description

Central Pond (MA52006) is located on the Massachusetts/ Rhode Island border with portions of the pond located in Providence and Pawtucket, RI and Seekonk, MA. The total watershed and subwatershed for Central Pond are shown on Figures 1A and 1B, respectively. Central Pond is located adjacent to the north end of the James V. Turner Reservoir (MA52022), west of Route152 and east of Route 1A (see Figure 1B). The Massachusetts portion in Seekonk has an area of approximately 5.8 acres. It is part of the Ten Mile River Watershed with its major contributors being the Ten Mile River and Coles Brook. Based on a review of aerial imagery, land use in the subwatershed consists of densely developed commercial, retail, and residential properties to the west in Pawtucket Rhode Island and residential and educational facilities to the east in Seekonk, MA.

MassDEP's *Ten Mile River Watershed 200 Water Quality Assessment Report*[2] for this receiving water identified four Use Groups as having an "impaired" status. Aquatic Life Use was deemed "impaired" because of elevated total phosphorus, organic enrichment, nutrient enrichment, low dissolved oxygen, dissolved oxygen saturation, aquatic plants/macrophystes, and excessive algal

[1] MassDEP, 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, 2002. Ten Mile River Watershed 2002 Water Quality Assessment Report. Aailable at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/52wqar.pdf

growth. Primary Contact, Secondary Contact, and Aesthetics Uses were deemed "impaired" due to excess algal growth, aquatic plants, macrophytes, and total phosphorus. The suspected sources of these impairments are municipal point source discharges from municipal separate storm sewer systems (MS4) and runoff from surrounding municipal areas (urbanized high density area).

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Central Pond is not proposed to change.

After review, it was determined that the MassDOT property does not discharge to Central Pond. It was determined that the nearest MassDOT-owned property (Route 44) is approximately 2.0 miles away and outside the Central Pond subwatershed.

As defined in MassDOT's assessment methodologies,[4] since this portion of MassDOT's urban area property does not directly contribute stormwater runoff to Cain Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, 6 April, 2011. Description of MassDOT's Application of Impervious Cover Method in BMP 7U (MassDOT Application of IC Method). http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/IC_MethodApplication2011Apr6.pdf

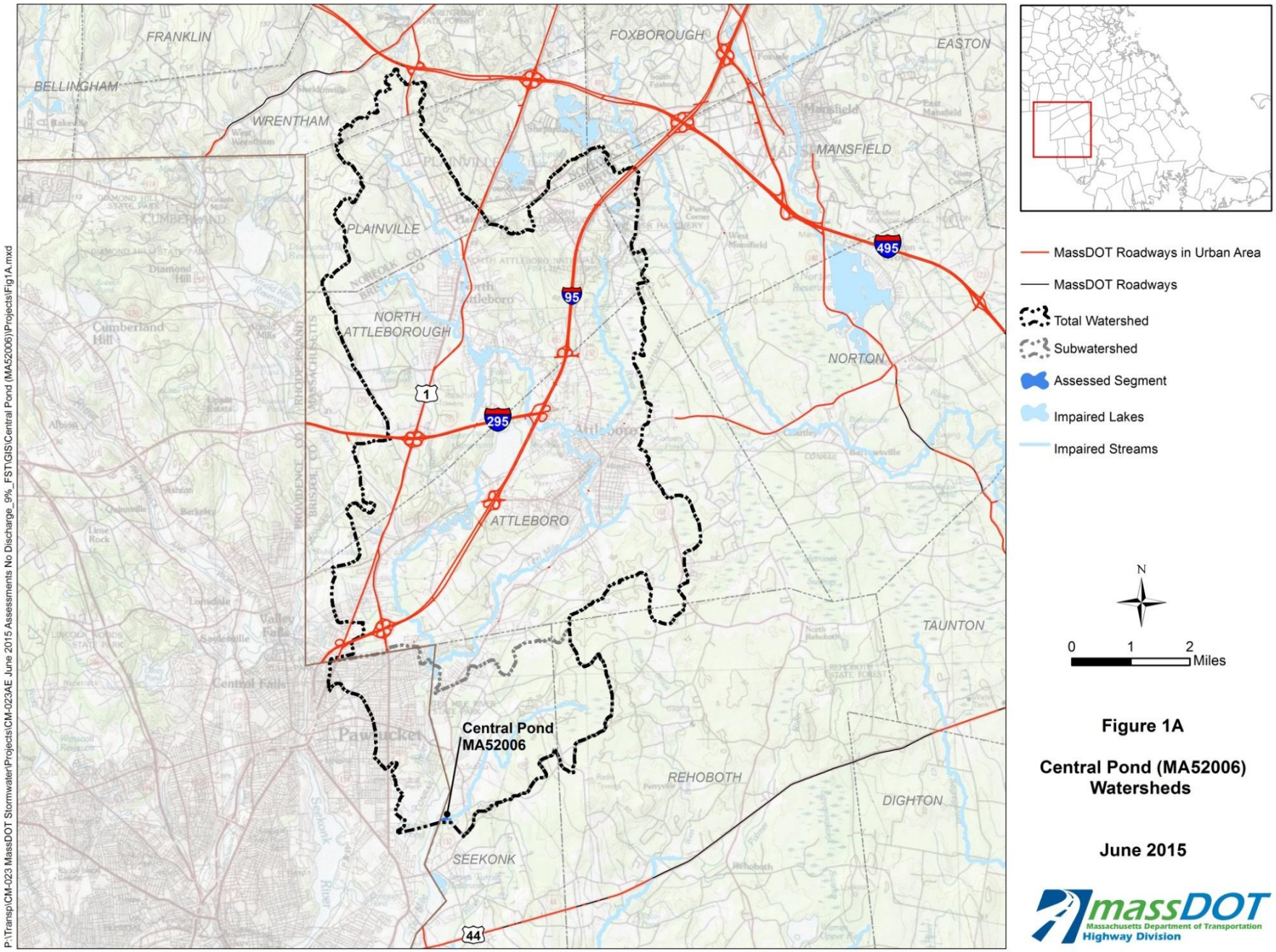

Figure 1A

Central Pond (MA52006) Watersheds

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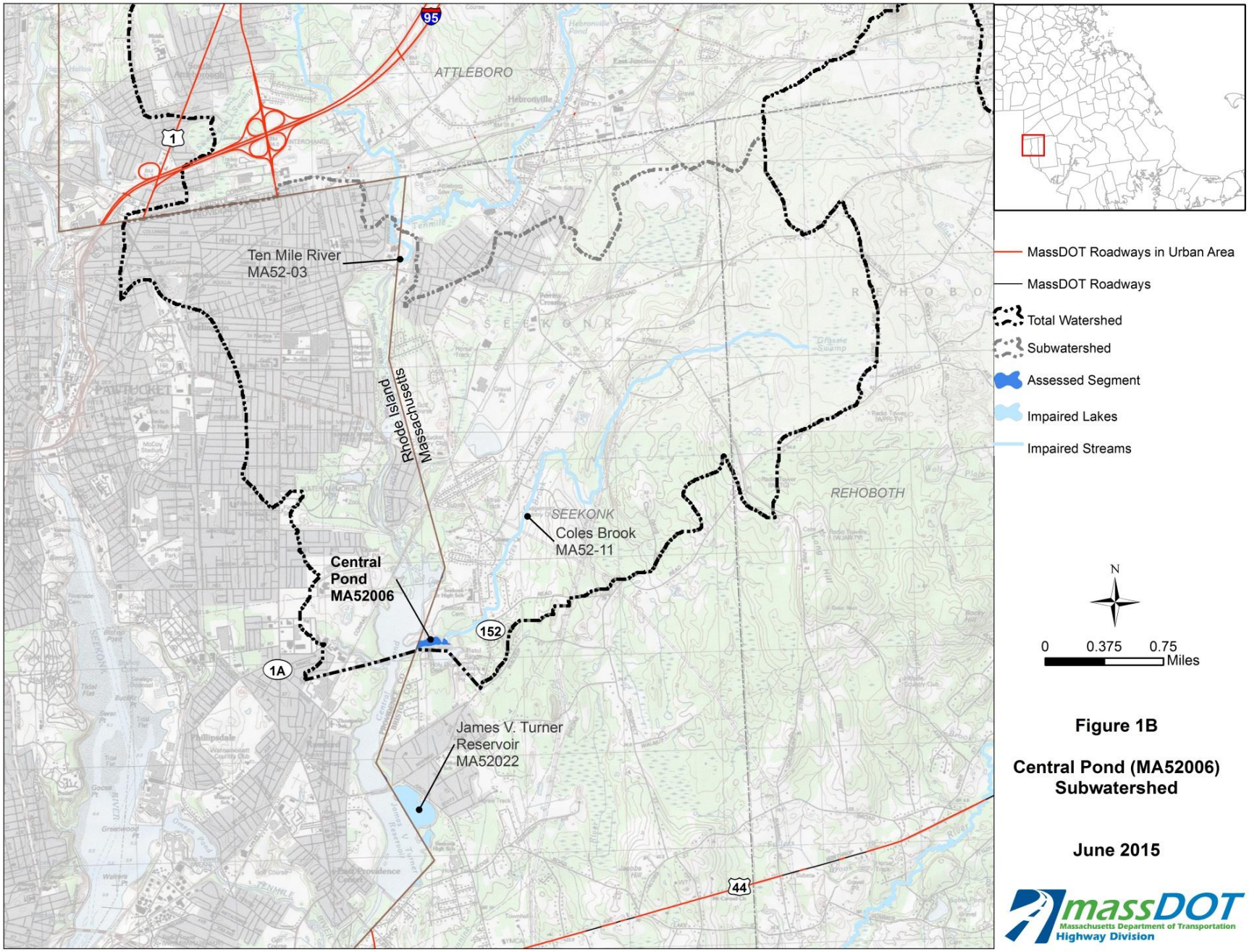

Figure 1B

Central Pond (MA52006) Subwatershed

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Impaired Waters Assessment for James V. Turner Reservoir (MA52022)

Summary

Impaired Water[1]	Impairments:	Stormwater:	*Aquatic Plants (Macrophytes), Dissolved Oxygen Saturation, Excess Algal Growth, Organic Enrichment (Sewage) Biological Indicators, Phosphorus (Total)*
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Ten Mile River Watershed 2002 Water Quality Assessment Report*[2]	
Location	Towns:	*Seekonk*	
	MassDOT Roads:	*None*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (IC Method) ☒	No Discharge ☒

Site Description

The James V. Turner Reservoir (MA52022) is an impoundment of the Ten Mile River along the Rhode Island and Massachusetts border. The majority of the waterbody is located in East Providence, Rhode Island (approximately 269 acres), but a small portion is located in Seekonk, Massachusetts (approximately 28.4 acres in the southeast area of the reservoir). The total and subwatershed for Turner Reservoir are shown on Figures 1A and 1B, respectively. Based on a review of aerial imagery, the land use within the watershed consists of densely developed residential neighborhoods, open space (golf courses, parkland) and undeveloped forest.

The MassDEP's *Ten Mile River Watershed 2002 Water Quality Assessment Report* for this receiving water identified the Aquatic Life Use as "impaired" due to elevated phosphorous (which in turn causes nutrient enrichment, low dissolved oxygen, and excessive algal growth, among others).[2] Furthermore, the Primary and Secondary Contact Uses, as well as the Aesthetics Use were also designated "impaired" due to excess algal growth, aquatic plants, and elevated total

[1] MassDEP, 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, 2006. Ten Mile River Watershed 2002 Water Quality Assessment Report Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/52wqar.pdf

phosphorus. The source is municipal point-source discharges, and other suspected sources include discharges from municipal separate storm sewer systems and other municipal sources (Urbanized High Density Area).[2]

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*. [1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of James V. Turner Reservoir is not proposed to change.

After review, it was determined that the MassDOT property does not discharge to James V. Turner Reservoir. The nearest MassDOT roadways within the watershed are Route 1, Route 1A, Interstate 95, and Interstate 295, which are all located more than four miles north of the Turner Reservoir, outside of the Reservoir's subwatershed. Route 44 is ½-mile south of the Reservoir, also outside of its watershed.

As defined in MassDOT's assessment methodology,[4] since this portion of MassDOT's urban area property does not directly contribute stormwater runoff to James V. Turner Reservoir, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, 6 April, 2011. Description of MassDOT's Application of Impervious Cover Method in BMP 7U (MassDOT Application of IC Method). http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/IC_MethodApplication2011Apr6.pdf

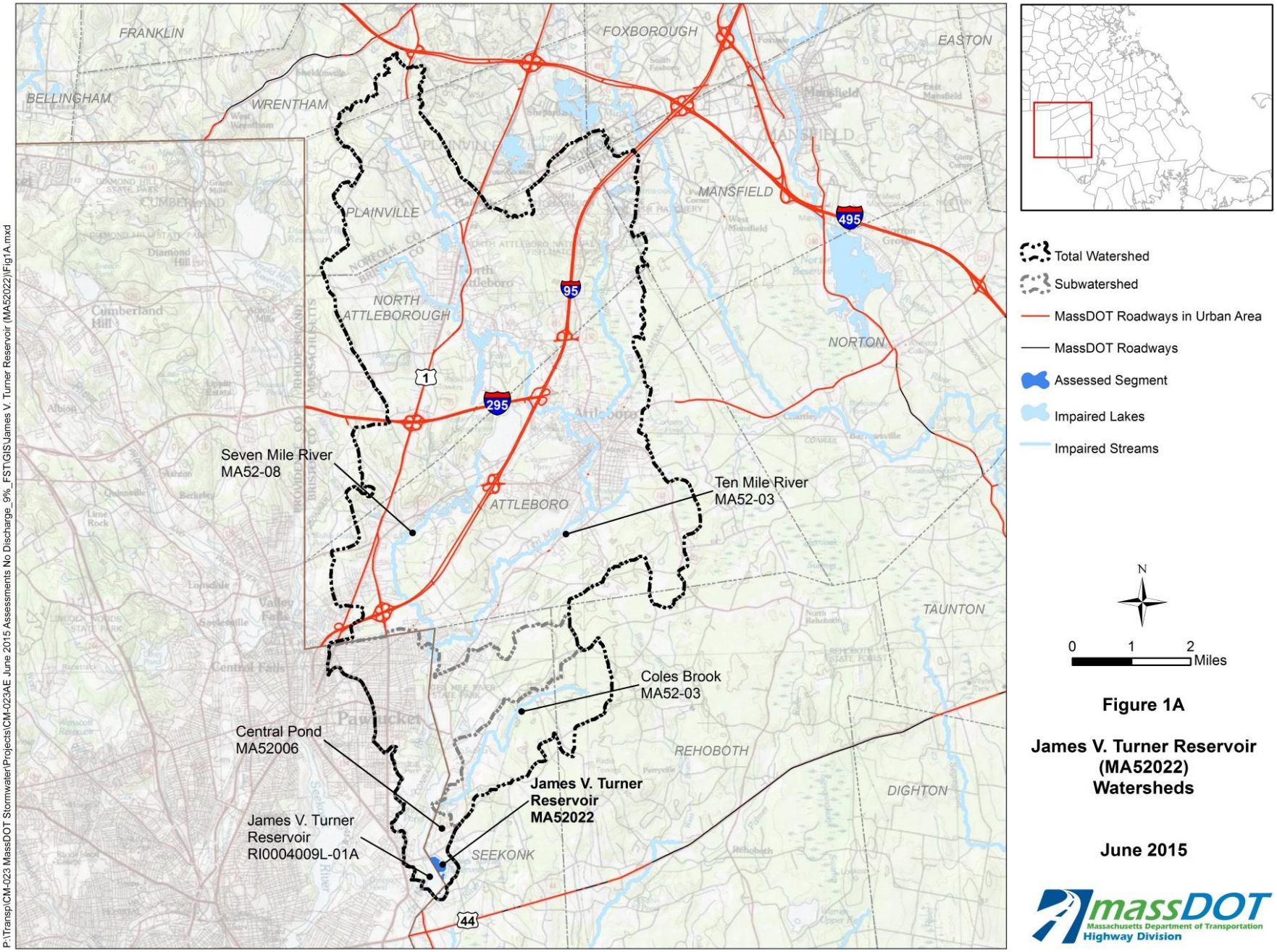

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Figure 1A

James V. Turner Reservoir (MA52022) Watersheds

June 2015

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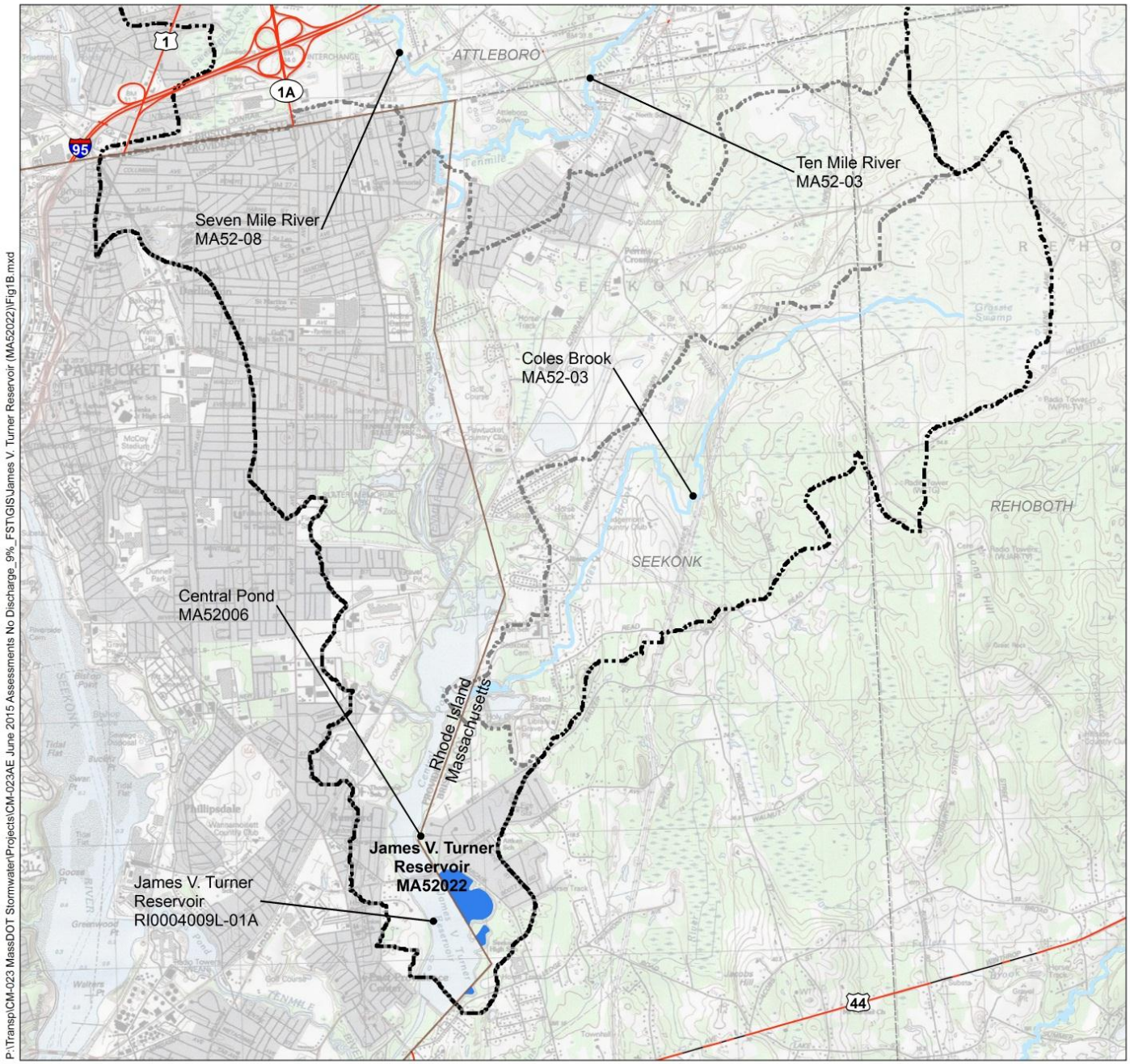

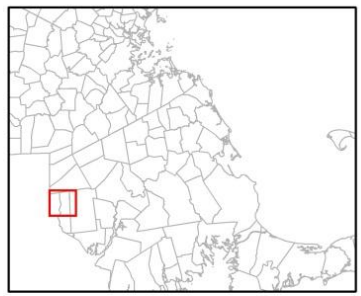

MassDOT Roadways in Urban Area

MassDOT Roadways

Total Watershed

Subwatershed

Assessed Segment

Impaired Lakes

Impaired Streams

N

0 0.375 0.75 Miles

Figure 1B

James V. Turner Reservoir (MA52022) Subwatershed

June 2015

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Impaired Waters Assessment for Quincy Bay (MA70-05)

Summary

Impaired Water[1]	Impairments:	Stormwater:	*Enterococcus, Fecal Coliform, Other*
		Non-Stormwater:[2]	*PCB in Fish Tissue*
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Boston Harbor 2004-2008 Water Quality Assessment Report*[3]	
Location	Towns:	*Quincy*	
	MassDOT Roads:	*None*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (IC Method) ☒	No Discharge ☒

Site Description

Quincy Bay is divided into two separate segments (MA70-04 and 70-05). Quincy Bay (MA70-05), the subject of this assessment, encompasses a large portion of Quincy Bay; primarily the outer portion of the embayment between Moon Island and Houghs Neck. MassDEP's *Boston Harbor 2004 - 2008 Water Quality Assessment Report* identifies the segment as "Quincy Bay, north of the class SA waters (segment MA70-04), Quincy to the line between Moon Head and Nut Island, Quincy."[3] Quincy Bay is an open body of water with an area of 4.41 square miles that is connected to the Atlantic Ocean, and is therefore tidal. The total and subwatershed to Quincy Bay are shown on Figures 1A and 1B, respectively. Land use is the watershed includes highly developed residential, commercial, and industrial uses.

Sources of discharge to this watershed include upstream sources (including from Quincy Bay MA70-04 and Furnace Brook), urban runoff (adjacent local roads and other impermeable surfaces),

[1] MassDEP, 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDOT, December 2012. Impaired Waters Assessment for Impaired Waters with Impairments Unrelated to Stormwater. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/impairedWaters/Year3//Year3_ImpairedWatersAssessment_1.pdf#page=308

[3] MassDEP, 2010. Boston Harbor 2004 - 2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/3baapp/70wqar08.pdf

and wet-weather discharges from SSOs and/or CSOs. The City of Quincy's NPDES permit for wastewater (MAR041081) allows for discharge to this water body.[3]

The MassDEP's *Boston Harbor 2004 - 2008 Water Quality Assessment Report* identified three Use Groups as having an "impaired" status.[3] The Primary Contact Recreation Use was deemed "Impaired" due to pathogens (enterococcus bacteria). The Shellfish Harvesting Use was deemed "Impaired" due to pathogens (fecal coliform). The Fish Consumption Use was also deemed "Impaired" due to the presence of PCBs in fish tissue. The Aquatic Life and Secondary Contact Uses were classified as "Support," and the Aesthetics Use was not assessed.

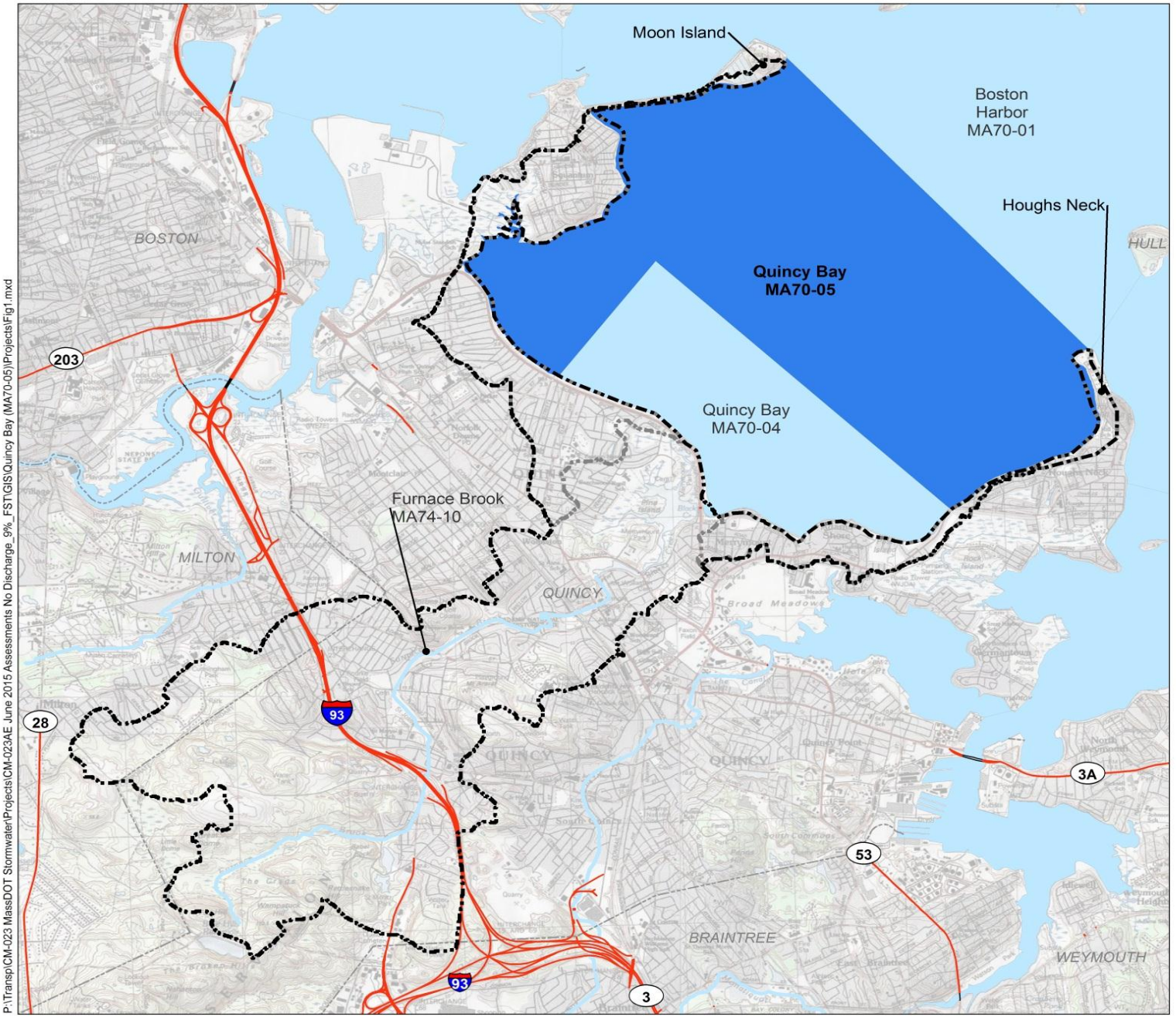
This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Quincy Bay is not proposed to change.

After review, it was determined that the MassDOT property does not discharge directly to Quincy Bay (MA70-05). MassDOT roadways in the total watershed include the Southeast Expressway (Interstate 93/Route 1/Route 3), which is located between a mile and two miles west and southwest of Quincy Bay. Within the subject watershed, these roadways discharge to Furnace Brook which flows to Quincy Bay (MA70-04). MassDOT's Quincy Shore Drive bridge over Blacks Creek also discharges to Quincy Bay (MA70-04). No MassDOT property is located within the subwatershed.

As defined in MassDOT's assessment methodology,[5] since this portion of MassDOT's urban area property does not directly contribute stormwater runoff to Quincy Bay, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

5 MassDOT, 6 April, 2011. Description of MassDOT's Application of Impervious Cover Method in BMP 7U (MassDOT Application of IC Method). http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/IC_MethodApplication2011Apr6.pdf



Total Watershed
Subwatershed
MassDOT Roadways in Urban Area
MassDOT Roadways
Assessed Segment
Impaired Lakes
Impaired Streams

N

0 0.375 0.75 Miles

Figure 1A

Quincy Bay (MA70-05) Watersheds

June 2015

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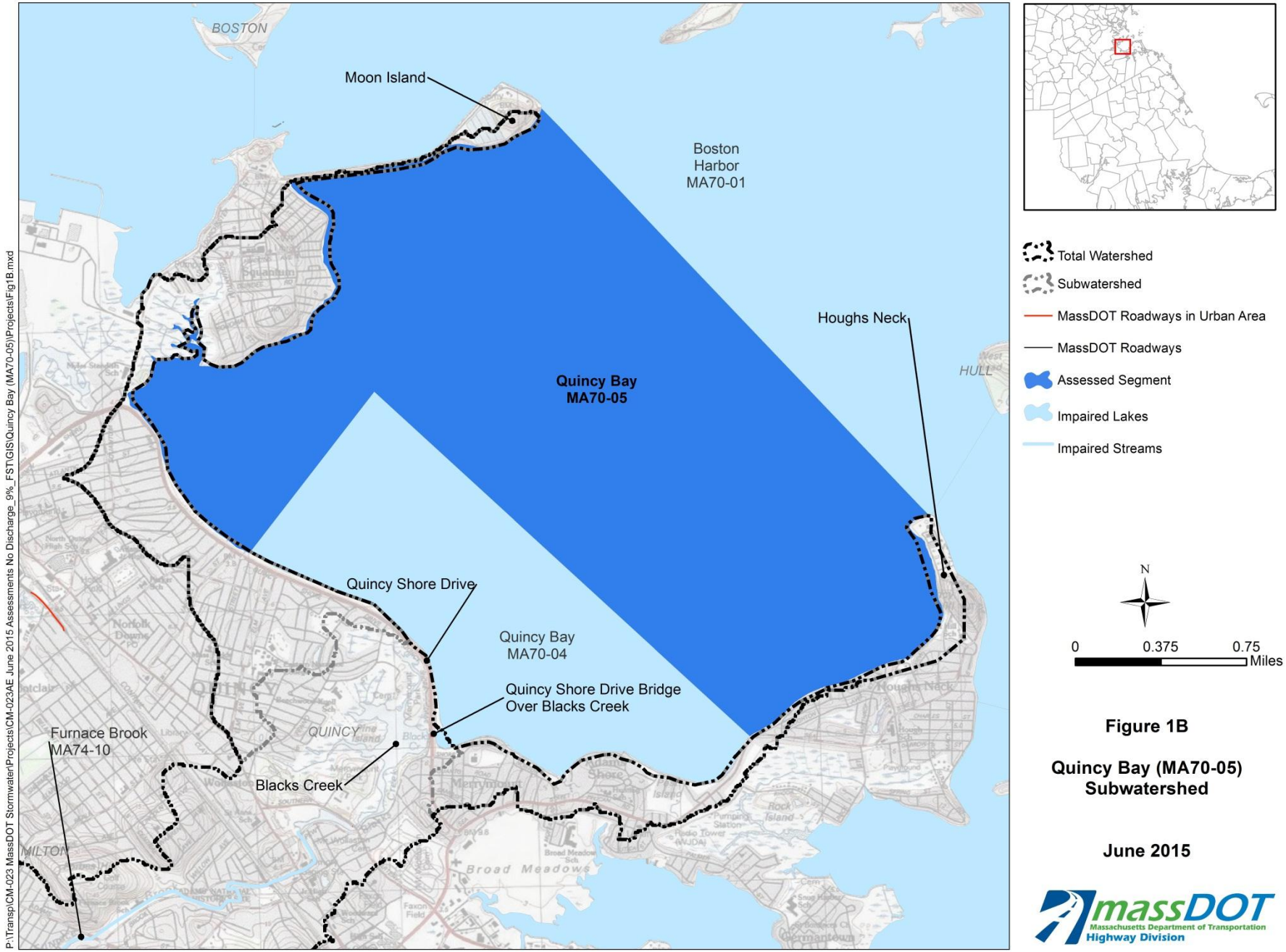

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Figure 1B

Quincy Bay (MA70-05) Subwatershed

June 2015

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Impaired Waters Assessment for Unnamed Tributary (MA71-13)

Summary

Impaired Water[1]	Stormwater Impairments:	*Escherichia Coli*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Mystic River Watershed and Coastal Drainage Area 2004–2008 Water Quality Assessment Report*[2]	
Location	Towns:	*Medford*	
	MassDOT Roads:	*I-93*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Unnamed Tributary (MA71-13) is located in Medford and flows south for 0.1 miles before joining with the Mystic River (MA71-02). It appears to be directly fed by Smelt Brook, a non-impaired stream, originating from South Reservoir, an unimpaired lake in the Middlesex Fells Reservation. Unnamed Tributary (MA71-13) begins where culverted flow emerges south of Route 16 (Figure 1).

The subwatershed to Unnamed Tributary is the same as the total watershed and covers 2.7 square miles, 2.4 square miles of which is in Medford, 0.2 square miles of which is in Stoneham, and 0.1 square miles of which is in Winchester. Over two-thirds of the watershed is occupied by the Middlesex Fells Reservation, where the dominant land uses are forest and water. The remainder of the watershed is developed, and high density residential areas dominate. The watershed delineation to Unnamed Tributary was modified to partially coincide with the subwatershed delineation to Mystic River (MA71-02) depicted in the *Impaired Waters Assessment for Mystic River (MA71-02) – Progress Report.*[3] That assessment indicates that runoff from the southern portion of I-93 (Figure 1 of this assessment) is piped directly to Mystic River (MA71-02).

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2010. Mystic River Watershed and Coastal Drainage Area 2004–2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/71wqar09.pdf

[3] MassDOT, June 2012. Impaired Waters Assessment for Mystic River (MA71-02) – Progress Report. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/impairedWaters/Year2/Attachment5.pdf#page=94

In the *Mystic River Watershed and Coastal Drainage Area 2004–2008 Water Quality Assessment Report,*[2] Unnamed Tributary is listed as a Class B waterbody, indicating that it is a habitat for fish, other aquatic life, and wildlife. The report indicates that the Aquatic Life designated use is "not assessed" for Unnamed Tributary, but an "alert" status is in place due to elevated total phosphorus and low dissolved oxygen. Fish Consumption is "not assessed" because the waterbody does not have a site-specific fish consumption advisory. Primary Contact is assessed as "impaired," since *E. coli* concentrations exceeded the applicable standard for all six years of testing. The report identifies unspecified urban stormwater as the source of the *E. coli.* Secondary Contact is assessed as "support," because *E. coli* concentrations exceeded the applicable standard for only one out of seven years. However, an "alert" status is in place due to single-sample exceedances. Aesthetics is assessed as "support," since accounts of color and odor were not objectionable.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Unnamed Tributary is not proposed to change.

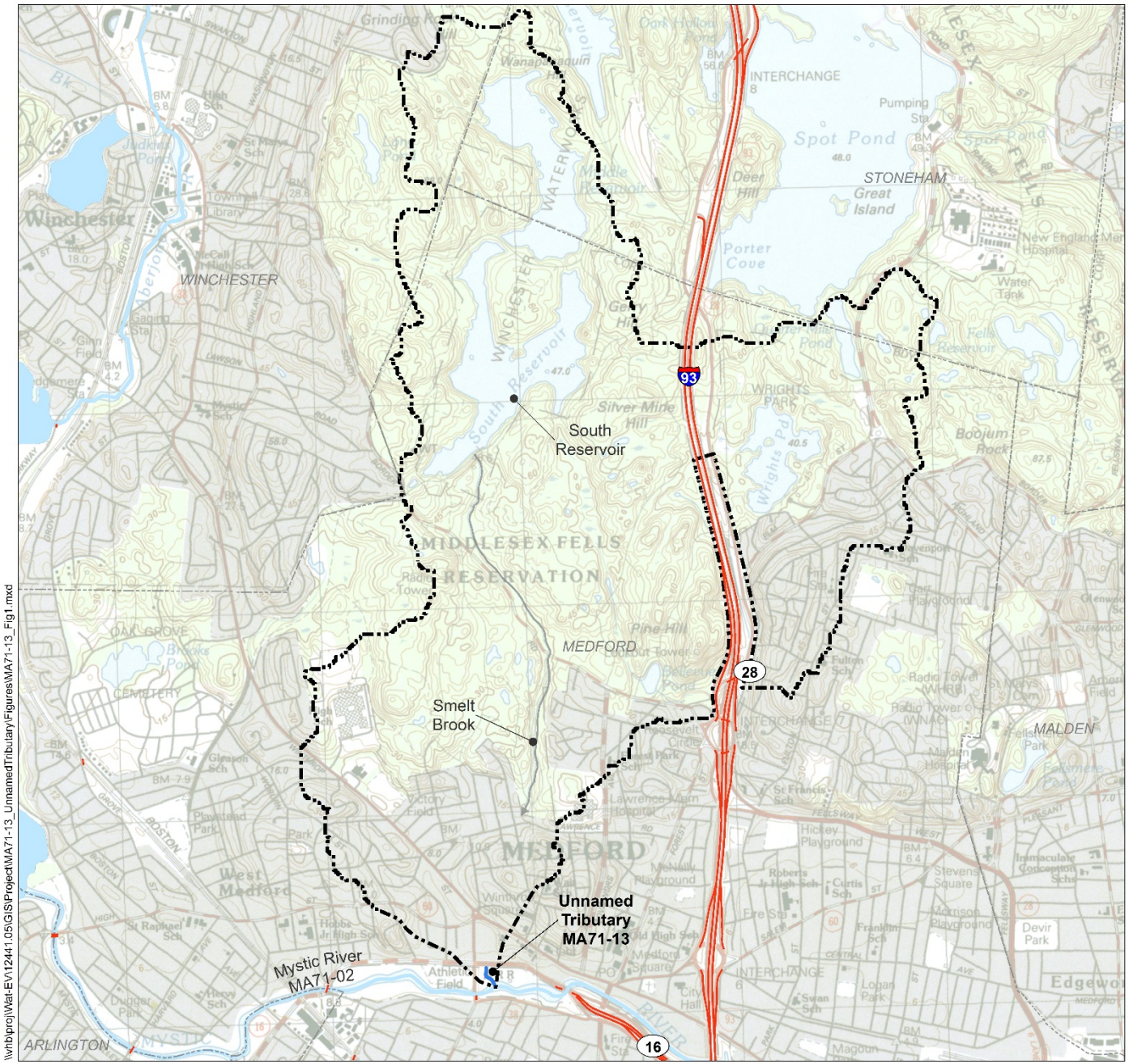
After review, it was determined that MassDOT property does not directly discharge to Unnamed Tributary. This conclusion was reached through analysis of MassDOT roads within the urban area, the waterbody's watershed, U.S. Geological Survey (USGS) topographic data, and the USGS National Hydrography Dataset.[5] An approximately 0.3-mile stretch of I-93 passes through the eastern portion of the watershed, but any discharges from the roadway would enter non-impaired streams that would pass through South Reservoir followed by Smelt Brook, a non-impaired stream, before reaching Unnamed Tributary. The shortest flow path between I-93 and Unnamed Tributary exceeds 2.0 miles.

As defined in MassDOT's assessment methodology,[6] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Unnamed Tributary, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] USGS National Hydrography Dataset. Available at: http://nhd.usgs.gov/data.html

[6] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf



MassDOT Roadways in Urban Area
MassDOT Roadways
Total Watershed
Assessed Segment
Impaired Lakes
Impaired Streams
Non-Impaired Streams

N

0 0.2 0.4 Miles

Figure 1

Unnamed Tributary (MA71-13) Watershed

June 2015

massDOT Massachusetts Department of Transportation Highway Division

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massDOT Massachusetts Department of Transportation Highway Division

6/08/2015

Impaired Waters Assessment for Memorial Pond (MA73012)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Plants (Macrophytes), Turbidity*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*Neponset River Watershed 2004 Water Quality Assessment Report*[2] and *U.S. EPA Water Quality Assessment 2012 Waterbody Report*[3]
Location	Towns:	*Walpole*
	MassDOT Roads:	*Route 1 and I-95*
Assessment Method(s)	7R (TMDL Method) ☐	7U (IC Method) ☒ No Discharge ☒

Site Description

Memorial Pond (MA73012) is an artificial impoundment within the Spring Brook drainage system. The pond is approximately eight acres in size, and ultimately drains to the Neponset River (MA73-01). The total and subwatershed to Memorial Pond are the same and is shown on Figure 1. Based on a review of aerial imagery, land uses in the watershed include transportation (I-95, Route 1, and MBTA rail lines), residential properties, two golf courses, and scattered commercial/retail development.

Spring Brook enters the pond at its southern end, and exits through a spillway that flows below School Street at the northwestern end of the pond. The Spring Brook system that flows to Memorial Pond involves flow through a series of three upstream ponds. The Spring Brook system consists of an unnamed tributary at the southeastern end of the watershed (adjacent to Route 1 and

[1] MassDEP, 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, 2010. Neponset River Watershed 2004 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/73wqar10.pdf

[3] EPA online database 2012 Waterbody Report for Memorial Pond. Available at: http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_list_id=MA73012&p_cycle=&p_report_type=

Interstate 95), which flows to Allen Pond. From Allen Pond, the stream flows to Clark Pond (MA73008), which outflows with input from another tributary to Diamond Pond, and ultimately to Memorial Pond.

An evaluation of Memorial Pond was not provided in the *Neponset River Watershed 2004 Water Quality Assessment Report* due to insufficient data.[2] Based on the *U.S. EPA Water Quality Assessment 2012 Waterbody Report* for Memorial Pond the status for this receiving water identified the Primary and Secondary Contact for Recreation Uses with an "impaired" status due to turbidity and noxious aquatic plants.[3] The sources of these impairments are reported as unknown. All other uses were not assessed.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Memorial Pond is not proposed to change.

After review, it was determined that the MassDOT property does not discharge to Memorial Pond. The nearest MassDOT roadways are Interstate 95 and Route 1, approximately 1.5 miles away in the headwaters of the non-impaired Spring Brook watershed. Memorial Pond is not considered to receive direct discharge from the Interstate 95/Route 1 area because the three upstream ponds receive runoff from upgradient sources including roadways, a historic sand and gravel facility, and adjacent residential and golf course properties. Route 1A is located outside of the watershed area.

As defined in MassDOT's assessment methodology,[5] since this portion of MassDOT's urban area property does not directly contribute stormwater runoff to Memorial Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] MassDOT, 6 April, 2011. Description of MassDOT's Application of Impervious Cover Method in BMP 7U (MassDOT Application of IC Method). http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/IC_MethodApplication2011Apr6.pdf

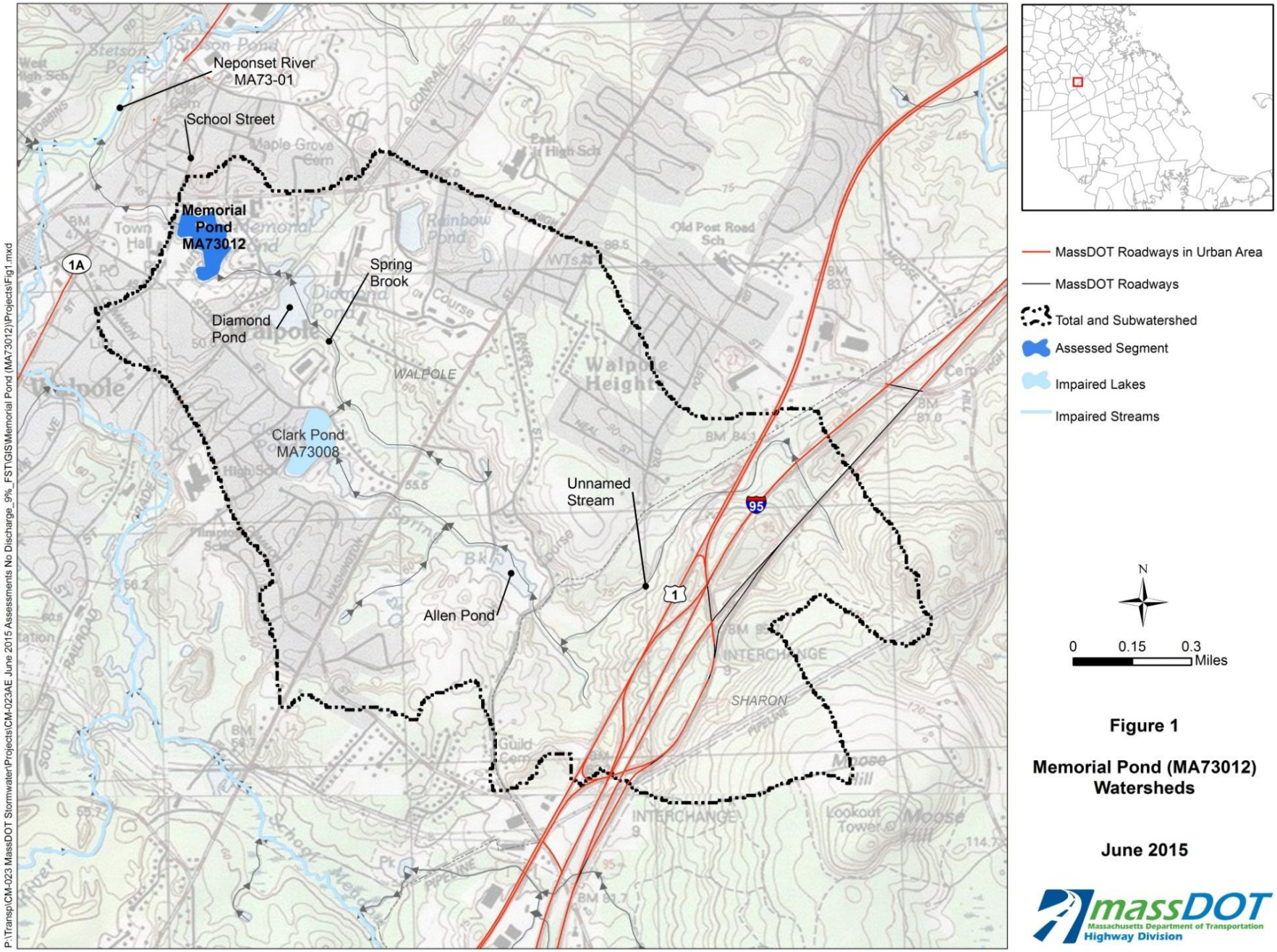

Figure 1

Memorial Pond (MA73012) Watersheds

June 2015

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06/08/2015

Impaired Waters Assessment for Bartlett Pond (MA81008)

Summary

Impaired Water[1]	Stormwater Impairments:	*Escherichia coli*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*None*	
Location	Towns:	*Lancaster*	
	MassDOT Roads:	*Interstate 190 and Route 12*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Bartlett Pond (MA81008) is located east of Interstate 190 and west of Brockelman Road in Lancaster, Massachusetts (Figure 1). Bartlett Pond has a surface area of approximately 5 acres and receives flows from Wekepeke Brook and an unnamed stream at its southern bank. Flows exit Bartlett Pond at its northernmost point to Unnamed Tributary (MA81-61).

An evaluation of Bartlett Pond was not provided in the *Nashua River Watershed 2003 Water Quality Assessment Report.*[2] According to the *Massachusetts Year 2012 Integrated List of Waters*[1] Bartlett Pond was added in 2012 to Category 5 (Waters requiring a TMDL) as impaired by *Escherichia coli* at the request of the Nashua River Watershed Association.

Figure 1 shows the total and subwatershed of Bartlett Pond. The watersheds are approximately 11 square miles and 4.7 square miles respectively and are located in Lancaster, Leominster and Sterling, Massachusetts. The watershed to Bartlett Pond is comprised of low density residential, pastures, and industrial with the majority of the watershed consisting of forested land, water and wetlands.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014*

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, August 2008. Nashua River Watershed 2003 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/81wqar08.pdf

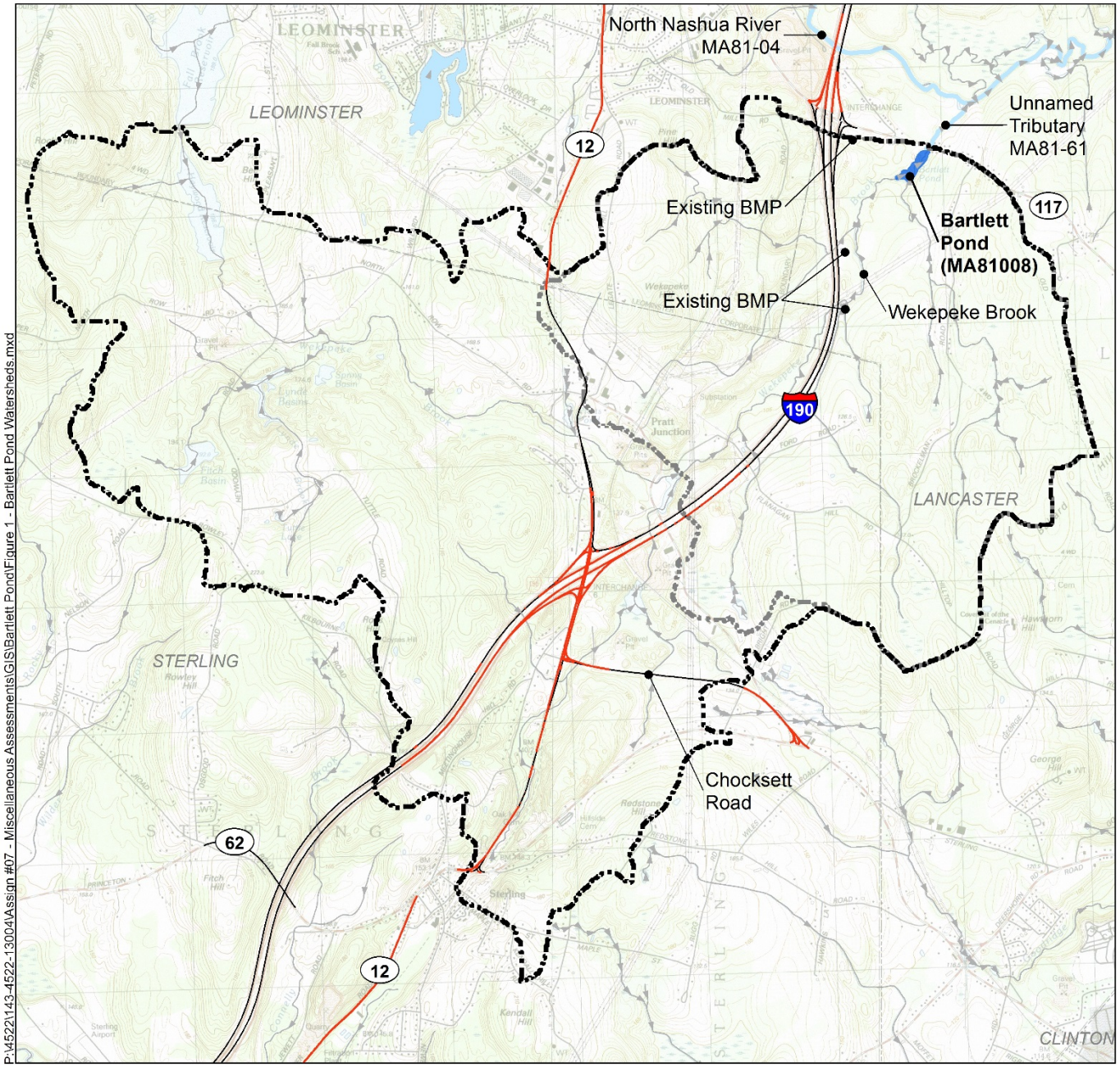
Integrated List of Waters, which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Bartlett Pond is not proposed to change.

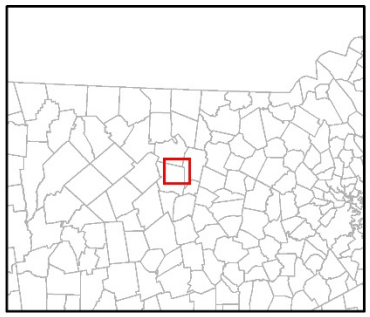
After review, it was determined that MassDOT property does not discharge to Bartlett Pond. This determination was made after a review of available record plans, aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned properties are is Interstate 190 (0.3 miles west) and Route 12 (1.5 miles west). The portions of Interstate 190 and Route 12 run through central and western portions, respectively, of the Bartlett Pond subwatershed. Stormwater from a portion of Interstate 190 is conveyed to three existing stormwater BMPs prior to discharge into Wekepeke Brook. The runoff from the remaining portions of Interstate 190 and Route 12 discharge to upland areas, wetland systems or other stream segments and therefore does not directly discharge to Bartlett Pond. It should be noted that only a small portion of the MassDOT-owned roadway in the Bartlett Pond subwatershed is within an MS4-regulated urban area.

As defined in MassDOT's assessment methodology, [4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Bartlett Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Total Watershed

Subwatershed

Assessed Segment

Impaired Lakes

Impaired Streams

NHD Flow Arrow

N

0 2,000 4,000 Feet

Figure 1

Bartlett Pond (MA81008) Watersheds

June 2015

MassDOT Massachusetts Department of Transportation Highway Division

P:\4522\1143-4522-13004\Assign #07 - Miscellaneous Assessments\GIS\Bartlett Pond\Figure 1 - Bartlett Pond Watersheds.mxd

06/08/2015

Impaired Waters Assessment for Unnamed Tributary (MA81-61)

Summary

Impaired Water[1]	Stormwater Impairments:	*Escherichia coli*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*None*	
Location	Towns:	*Lancaster*	
	MassDOT Roads:	*Interstate 190 and Route 12*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Unnamed Tributary (MA81-61), locally considered a portion of Wekepeke Brook, originates at the outlet of Bartlett Pond (MA81008) and flows northeast for approximately 0.3 miles to its confluence with the North Nashua River (MA81-04) in Lancaster, Massachusetts (Figure 1).

An evaluation of the Unnamed Tributary was not provided in the *Nashua River Watershed 2003 Water Quality Assessment Report.* [2] According to the *Massachusetts Year 2010 Integrated List of Waters*[3] the Unnamed Tributary was added in 2010 to Category 5 (Waters requiring a TMDL) as impaired by *Escherichia coli* based on public comment.

Figures 1A and 1B show the total and subwatershed of Unnamed Tributary. The watersheds are approximately 12 square miles and 4.9 square miles respectively and are located in Lancaster, Leominster and Sterling, Massachusetts. The watershed to Unnamed Tributary is comprised of low density residential, pastures, and industrial with the majority of the watershed consisting of forested land, water and wetlands.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314*

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, August 2008. Nashua River Watershed 2003 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/81wqar08.pdf

[3] MassDEP, June 2011. Massachusetts Year 2010 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/10list6.pdf

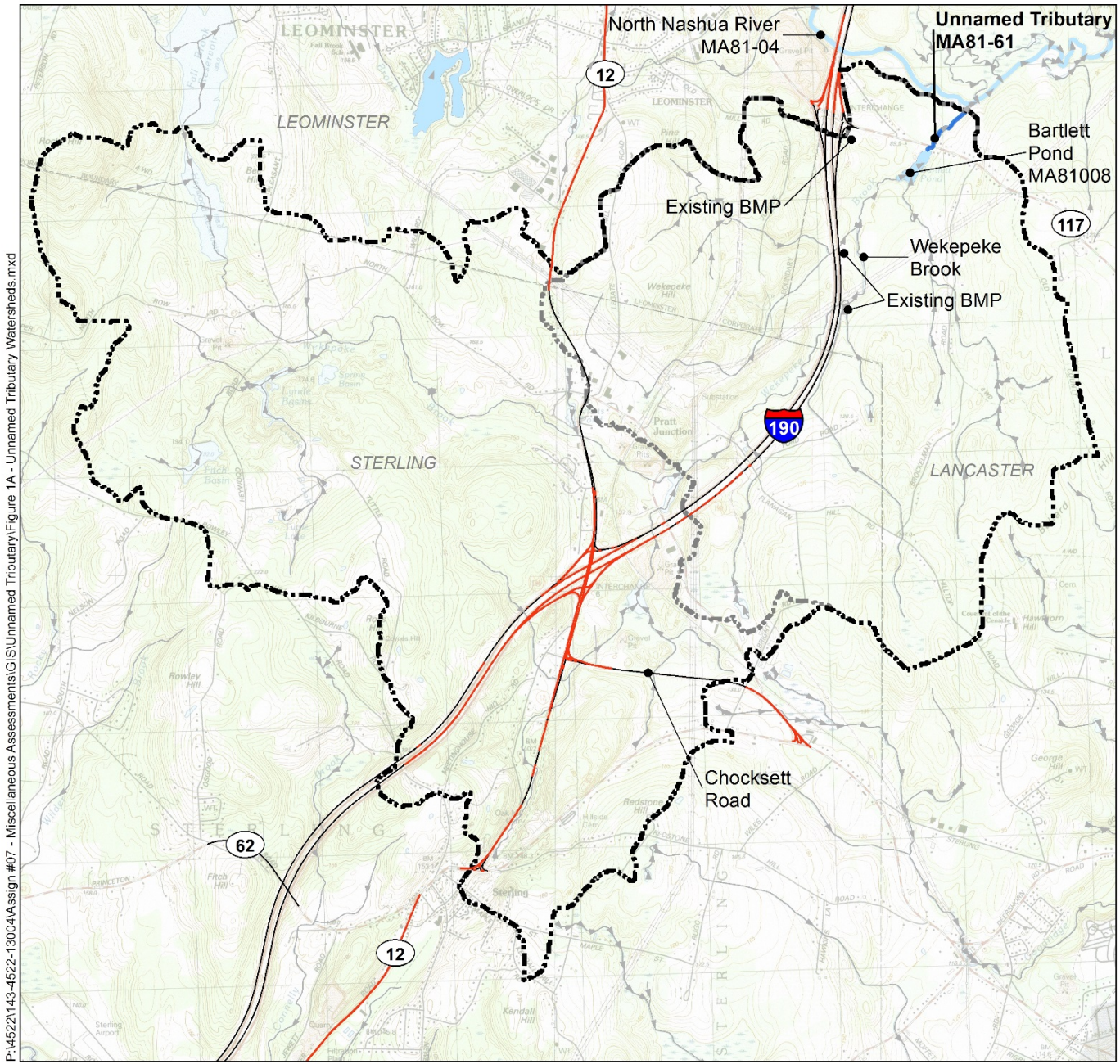
and 303(d) of the Clean Water Act.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Unnamed Tributary is not proposed to change.

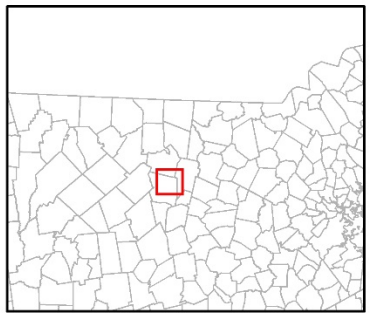
After review, it was determined that MassDOT property does not discharge to the Unnamed Tributary. This determination was made after a review of available record plans, aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned properties are is Interstate 190 (0.4 miles west) and Route 12 (1.6 miles west). The portions of Interstate 190 and Route 12 run through central and western portions, respectively, of the Unnamed Tributary subwatershed. Stormwater from a portion of Interstate 190 is conveyed to three existing stormwater BMPs prior to discharge into Wekepeke Brook. The runoff from the remaining portions of Interstate 190 and Route 12 discharge to upland areas, wetland systems or other stream segments and therefore does not directly discharge to the Unnamed Tributary. It should be noted that only a small portion of the MassDOT-owned roadway in the Unnamed Tributary subwatershed is within an MS4-regulated urban area.

As defined in MassDOT's assessment methodology, [5] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Unnamed Tributary, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area
MassDOT Roadways
Total Watershed
Subwatershed
Assessed Segment
Impaired Lakes
Impaired Streams
NHD Flow Arrow

N

0 2,000 4,000 Feet

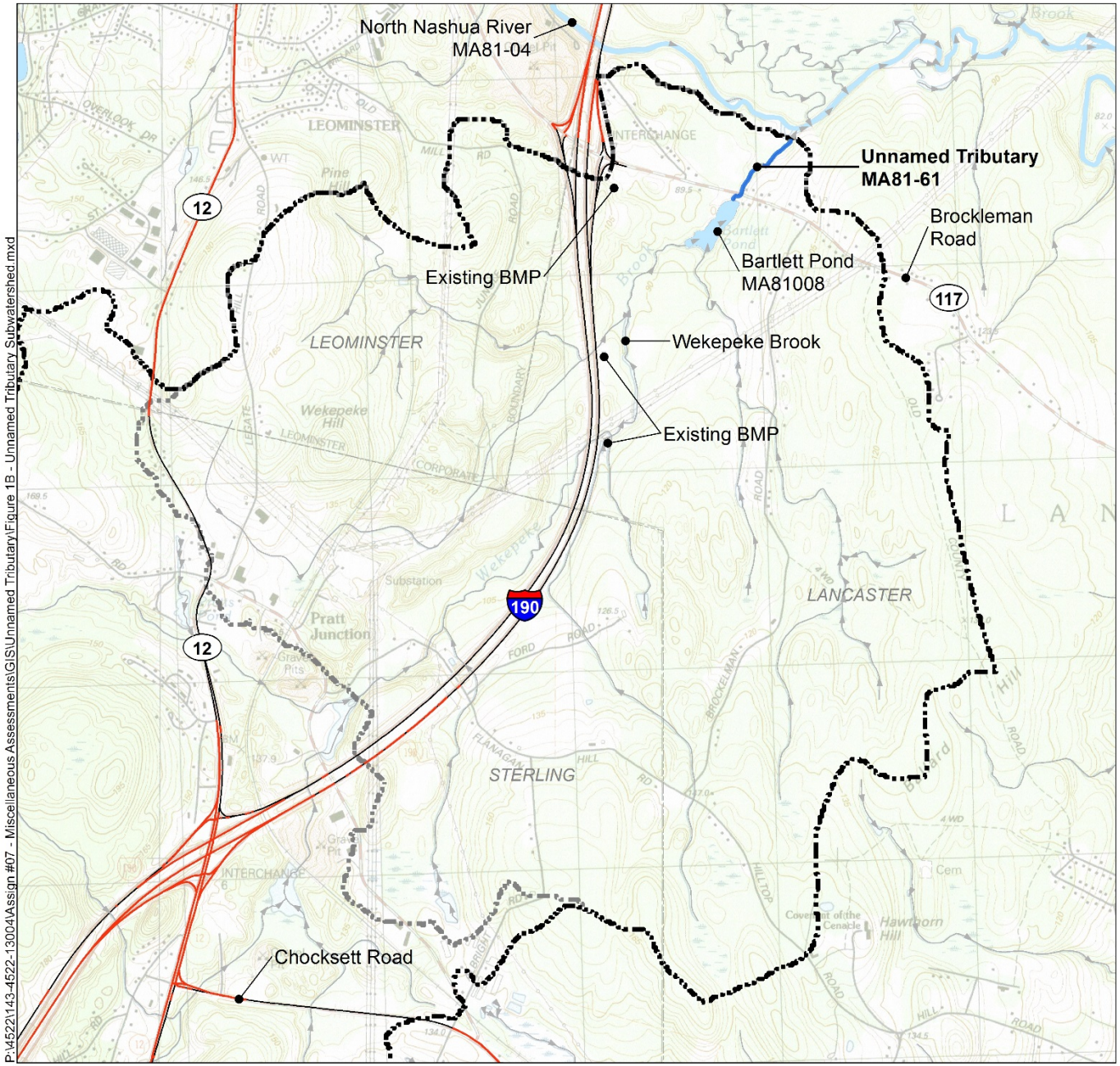
Figure 1A

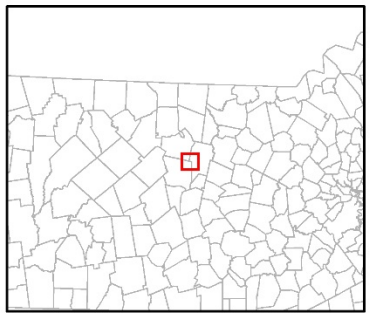
Unnamed Tributary (MA81-61) Watersheds

June 2015

massDOT
Massachusetts Department of Transportation
Highway Division

P:\4522\143-4522-13004\Assign #07 - Miscellaneous Assessments\GIS\Unnamed Tributary\Figure 1A - Unnamed Tributary Watersheds.mxd





MassDOT Roadways in Urban Area
MassDOT Roadways
Total Watershed
Subwatershed
Assessed Segment
Impaired Lakes
Impaired Streams
NHD Flow Arrow

N

0 1,300 2,600 Feet

Figure 1B

Unnamed Tributary (MA81-61) Subwatershed

June 2015

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Highway Division

P:\14522\143-4522-13004\Assign #07 - Miscellaneous Assessments\GIS\Unnamed Tributary\Figure 1B - Unnamed Tributary Subwatershed.mxd

06/08/2015

Impaired Waters Assessment for Tadmuck Brook (MA84B-07)

Summary

Impaired Water[1]	Stormwater Impairments:	*Escherichia coli*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Merrimack River Watershed 2004 Water Quality Assessment Report*[2]	
Location	Towns:	*Westford*	
	MassDOT Roads:	*Interstate 495, Route 110 and Boston Road*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Tadmuck Brook (MA84B-07) originates south of Main Street and east of Chamberlain Road and flows north for approximately 1.4 miles to its confluence with Stony Brook (MA84B-03) in Westford, Massachusetts (Figure 1).

MassDEP's *Merrimack River Watershed 2004 Water Quality Assessment Report*[2] identified the Primary Contact use with an "impaired" status due to elevated *Escherichia coli* measurements encountered during sampling. The source of this impairment is unspecified urban stormwater and other unknown sources. Elevated bacteria levels during a wet weather sampling event caused the Secondary Contact use to be identified with an "alert" status, whereas the low number of fish found during backpack electrofishing was the cause for the Aquatic Life use to be classified with an "alert" status. Field observations did not indicate any objectionable deposits, odors, colors or overabundant growths of aquatic plants or algae, so the Aesthetics use was identified as "support", while Fish Consumption use was "not assessed".

Figure 1 shows the total and subwatershed of Tadmuck Brook, which are the same, totaling approximately 2.0 square miles and are located in Chelmsford and Westford, Massachusetts. The watershed to Tadmuck Brook is comprised of commercial area, open land, water and wetlands with the majority of the watershed consisting of forested land and low density residential.

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, January 2010. Merrimack River Watershed 2004-2009 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/84wqar09.pdf

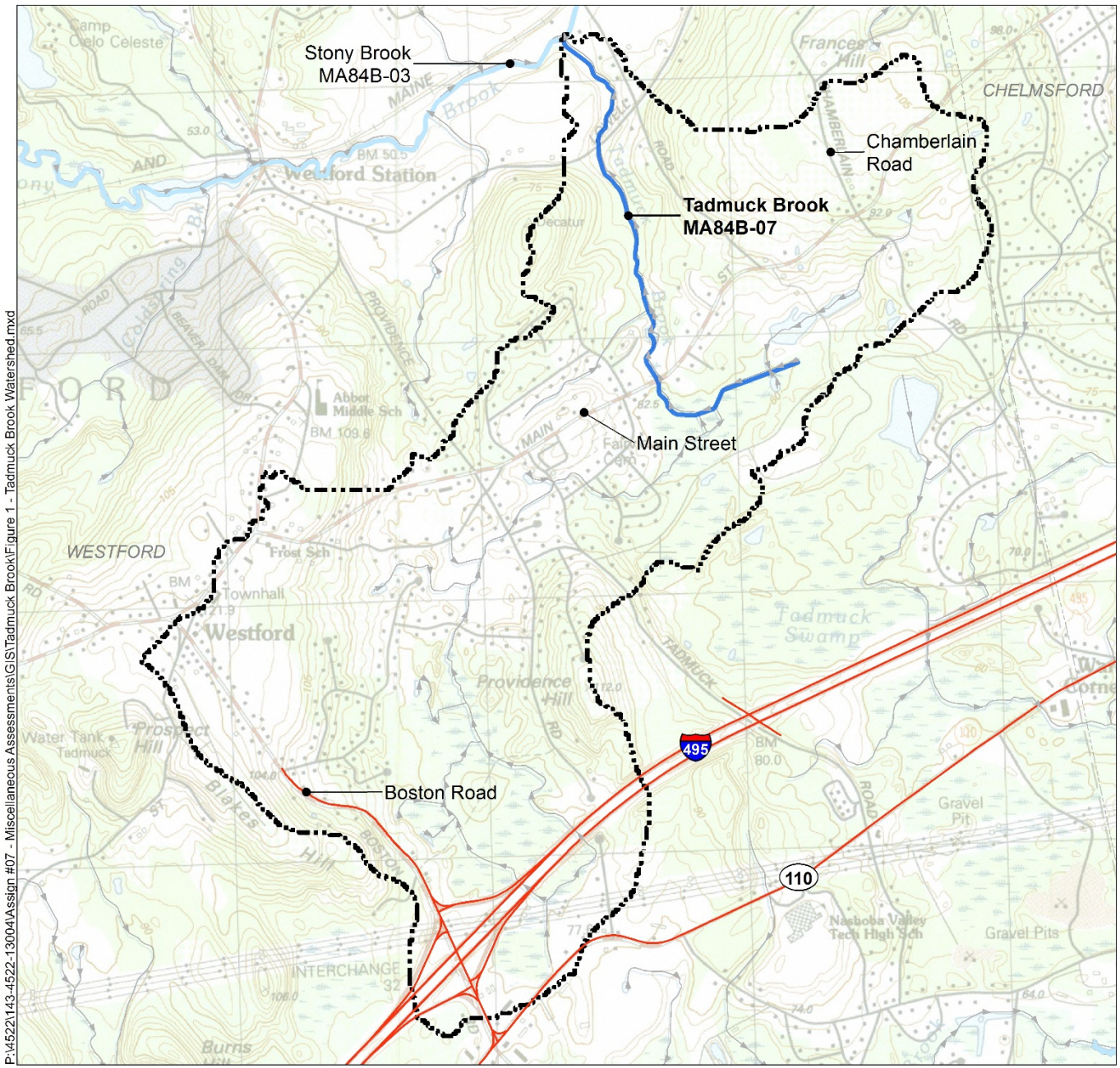
This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Tadmuch Brook is not proposed to change.

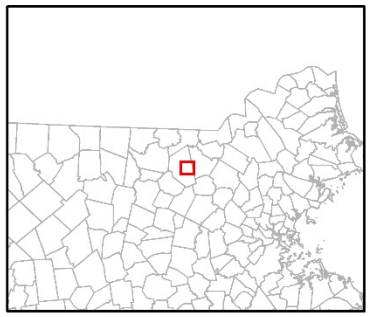
After review, it was determined that MassDOT property does not discharge to Tadmuck Brook. This determination was made based on a review of aerials, hydrographic data and watershed mapping. The nearest MassDOT-owned properties are Interstate 495 (0.7 miles south) and Boston Road (1.2 miles southwest). The sections of Interstate 495, Route 110 and Boston Road in Westford run through the southern portion of the watershed. The runoff from these portions of roadway discharge to upland areas, wetland systems or other stream segments and therefore does not directly discharge to Tadmuck Brook.

As defined in MassDOT's assessment methodology, [4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Tadmuck Brook, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Watershed

Assessed Segment

Impaired Streams

NHD Flow Arrow

N

0 1,000 2,000 Feet

Figure 1

Tadmuck Brook (MA84B-07) Watershed

June 2015

MassDOT Massachusetts Department of Transportation Highway Division

P:\45221\143-4522-13004\Assign #07 - Miscellaneous Assessments\GIS\Tadmuck Brook\Figure 1 - Tadmuck Brook Watershed.mxd

06/08/2015

Impaired Waters Assessment for Labor In Vain Creek (MA92-22)

Summary

Impaired Water[1]	Stormwater Impairments:	*Dissolved Oxygen, Fecal Coliform*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Ipswich River Watershed 2000 Water Quality Assessment Report*[2]	
Location	Towns:	*Ipswich*	
	MassDOT Roads:	*None*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Labor In Vain Creek (MA92-22), located in Ipswich, is 0.03 square miles in size and flows into the Ipswich River (MA92-02). The subwatershed to Labor In Vain Creek is the same as its total watershed and covers 2.1 square miles, all of which is in Ipswich. Refer to Figure 1 for the watershed delineation. Land use within the watershed is primarily saltwater wetland, forest, pasture, and cropland.

In the *Ipswich River Watershed 2000 Water Quality Assessment Report,*[2] Labor In Vain Creek is listed as a Class SA waterbody, indicating that it is a habitat for fish, other aquatic life, and wildlife. Labor In Vain Creek is assessed as "impaired" for its Shellfish Harvesting designated use due to fecal coliform. The source of the bacteria is reported as unknown, but municipal separate storm sewers (MS4s) are listed as a suspected source. All other uses were "not assessed" due to lack of recent, quality-assured water quality data.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014*

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, April, 2004. Ipswich River Watershed 2000 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/92wqar.pdf

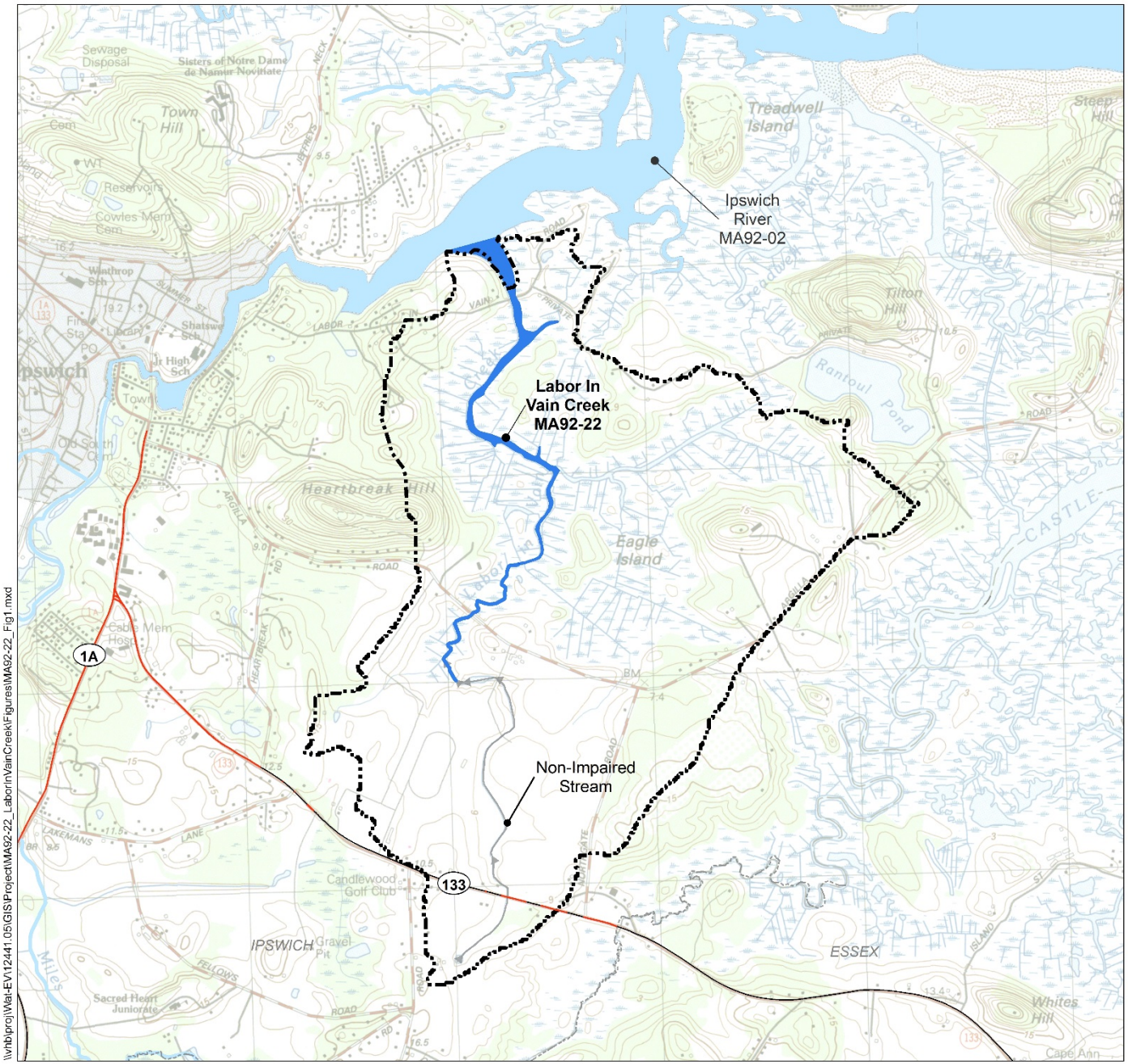
Integrated List of Waters, which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of Labor In Vain Creek is not proposed to change.

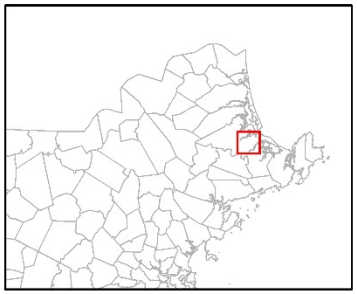
After review, it was determined that MassDOT property does not directly discharge to Labor In Vain Creek. Approximately 800 feet of MassDOT-owned roadway within the urban area along Route 133 discharges to a non-impaired stream that flows for 0.9 miles through cropland and non-forested wetland before joining Labor In Vain Creek. Since stormwater from the roadway enters a different receiving waterbody, the discharge from the road is not considered directly contributing to the impairment of Labor In Vain Creek. This conclusion was reached through analysis of topographic data, MassDOT roadways within the urban area, and impaired and non-impaired waters within the watershed.

As defined in MassDOT's assessment methodologies,[4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Labor In Vain Creek, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf





MassDOT Roadways in Urban Area

MassDOT Roadways

Total Watershed

Assessed Segment

Assessed Segment

Impaired Lakes

Impaired Streams

Non-Impaired Streams

N

0 0.2 0.4 Miles

Figure 1

Labor In Vain Creek (MA92-22) Watershed

June 2015

massDOT Massachusetts Department of Transportation Highway Division

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06/08/2015

Impaired Waters Assessment for Salem Sound (MA93-56)

Summary

Impaired Water[1]	Stormwater Impairments:	*Fecal Coliform*	
	Category:	*5 (Waters requiring a TMDL), pending change to 4A (TMDL is completed) in proposed 2014 list*[2]	
	Final TMDLs:	*Final Pathogen TMDL for the North Coastal Watershed*[3]	
	WQ Assessment:	*North Shore Coastal Watersheds 2002 Water Quality Assessment Report*[4] and *EPA 2012 Waterbody Report for Salem Sound*[5]	
Location	Towns:	*Marblehead*	
	MassDOT Roads:	*None*	
Assessment Method(s)	7R (TMDL Method) ☒	7U (Non-TMDL Method) ☐	No Discharge ☒

Site Description

Salem Sound (MA93-56) is a 2.6-square-mile waterbody demarcated as the waters landward of an imaginary line from Naugus Head, Marblehead to the northeast corner of Bakers Island, Salem to Lighthouse Point, Marblehead—excluding Marblehead Harbor (MA93-22). Refer to Figure 1 for the waterbody location and its watershed delineation. The extents of waterbody MA93-56 were established in the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] Its

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[3] MassDEP, March 2012. Final Pathogen TMDL for the North Coastal Watershed. Available at: http://www.mass.gov/eea/docs/dep/water/resources/n-thru-y/ncoastl1.pdf

[4] MassDEP, March 2007. North Shore Coastal Watersheds 2002 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/93wqar06.pdf

[5] EPA, 2012. 2012 Waterbody Report for Salem Sound. Available at: http://ofmpub.epa.gov/tmdl_waters10/attains_waterbody.control?p_list_id=&p_au_id=MA93-56&p_cycle=2012&p_state=MA

seaward boundaries are shared with Salem Harbor (MA93-54) and Salem Sound (MA93-55) to the north and Marblehead Harbor (MA93-22) to the south.

The Salem Sound (MA93-56) waterbody segment was originally part of former segment Salem Sound (MA93-25), which was divided into three sections as of the 2012 version of the Integrated List of Waters to form part of Salem Harbor (MA93-54) and two portions of Salem Sound (MA93-55 and MA93-56). Former segment Salem Sound (MA93-25), which was included in the list of potential impaired water bodies receiving MassDOT stormwater runoff in the 2010 EPA enforcement order, is fully covered under the assessments for these three waterbodies.

The subwatershed to Salem Sound (MA93-56) is the same as its total watershed and covers 1.6 square miles, all of which is in Marblehead (Figure 1). The land use within the watershed is primarily residential with pockets of forest, industrial areas, and commercial areas.

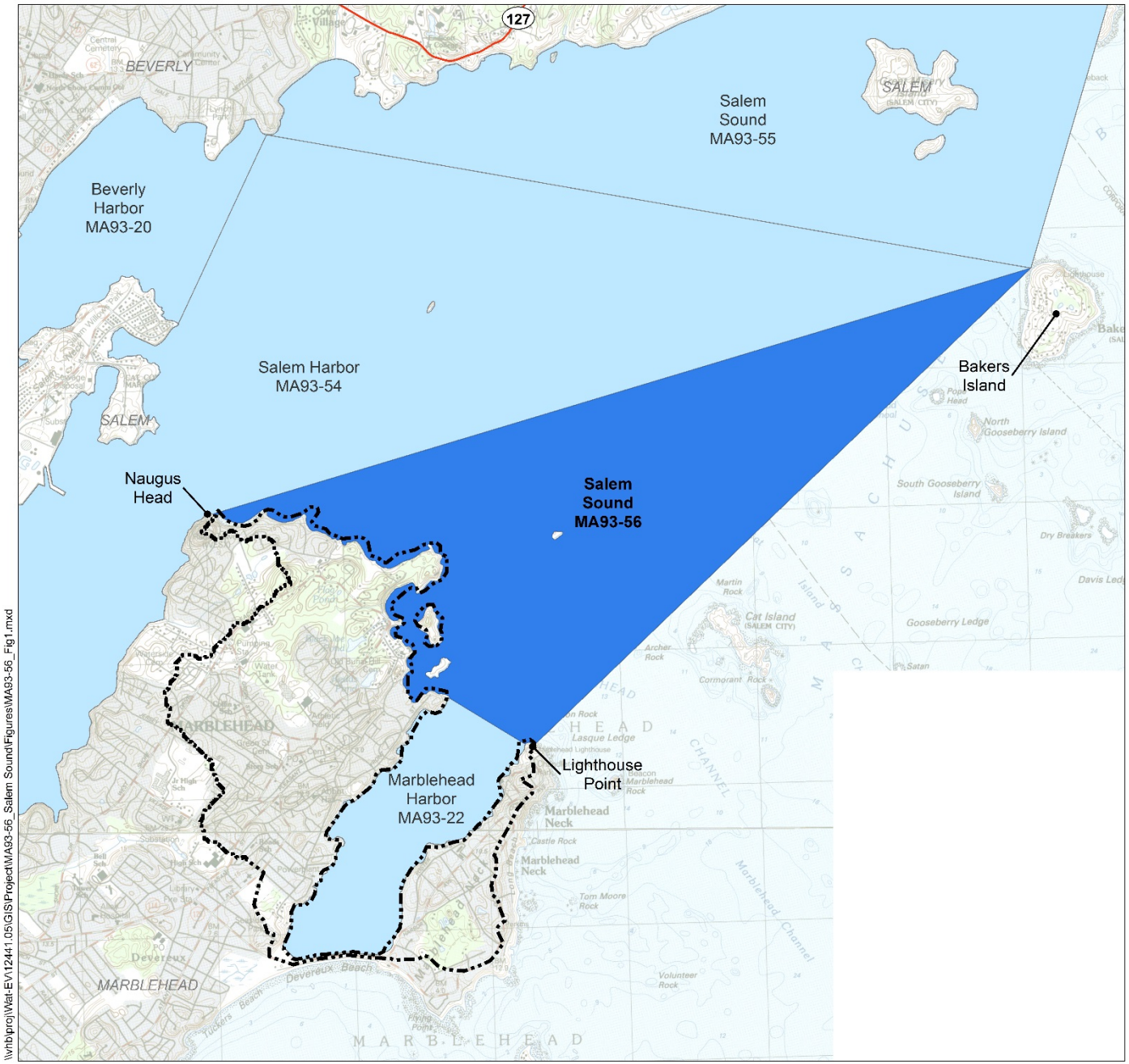
The section targeting Salem Sound in the *North Shore Coastal Watersheds 2002 Water Quality Assessment Report* is written for former waterbody MA93-25.[4] Based on the EPA's *2012 Waterbody Report for Salem Sound* (MA93-56), Aesthetics, Primary Contact Recreation, and Secondary Contact Recreation are in "good" standing. Shellfish Harvesting is "impaired," with the probable source listed as discharges from municipal separate storm sewer systems. Fish Consumption and Fish, Other Aquatic Life, and Wildlife are not assessed.[5]

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[2] Salem Sound is proposed to change to a Category 4A water (TMDL is completed) because it is now covered under the *Final Pathogen TMDL for the North Coastal Watershed*.[3]

After review of MassDOT roadways within the urban area, the waterbody's watershed, and U.S. Geological Survey (USGS) topographic data, it was determined that MassDOT roadway does not discharge to Salem Sound. Analysis of these factors revealed that there are no MassDOT-owned roads in the watershed.

As defined in MassDOT's assessment methodology, [6] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Salem Sound, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[6] MassDOT, July 2010. BMP 7R: TMDL Watershed Review. Available at:
http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7R_TMDL_WatershedReview.pdf



MassDOT Roadways in Urban Area

MassDOT Roadways

Total Watershed

Assessed Segment

Impaired Waterbody

N

0 0.3 0.6 Miles

Figure 1

Salem Sound (MA93-56) Watershed

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Impaired Waters Assessment for Billington Sea (MA94007)

Summary

Impaired Water[1]	Stormwater Impairments:	*Excess Algal Growth; Turbidity*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* [2]	
Location	Towns:	*Plymouth*	
	MassDOT Roads:	*Route 3 and Route 80*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Billington Sea (MA94007) is a water body approximately 263 acres in size located in Plymouth, Massachusetts (Figure 1). Billington Sea receives flow from Briggs Reservoir (MA94020), Cooks Pond (MA94027), and Great South Pond (MA94054). Flow leaves Billington Sea through Town Brook and ultimately discharges to Plymouth Harbor (MA94-16).

Billington Sea (MA94007) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography. [3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] Figure 1 illustrates the groundwatershed for Billington Sea (MA94007).

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2006. South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/94wqar3.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

MassDEP's *South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* [2] for Billington Sea identified the Aquatic Life, Fish Consumption, Primary and Secondary Contact Recreational Uses, and Aesthetics as "not assessed".

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Billington Sea (MA94007) is not proposed to change.

Land use in the Billington Sea (MA94007) groundwatershed is primarily forest, residential, and cranberry bogs. MassDOT-owned property within the groundwatershed includes Route 3 and Route 80, located north-east and north-west, respectively of Billington Sea.

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Billington Sea is an inland lake impaired for excess algal growth and turbidity, which are typically related to eutrophication processes caused by excess phosphorous.[6] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Billington Sea as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Billington Sea. The closest MassDOT-owned property within the mapped urban area is Route 3, located approximately 0.4 miles east and downstream of the Billington Sea outlet (Figure 1). According to field observations, stormwater outfalls along Route 3 in this area appear to discharge downstream of Billington Sea. Route 80 is located in the northern side of the watershed, west of Billington Sea. Runoff from Route 80 is collected with catch basin networks which discharge immediately next to the roadway where it infiltrates into the ground. Although Route 80 is located within the groundwatershed of Billington Sea, runoff from this road does not directly discharge to the waterbody.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Billington Sea, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

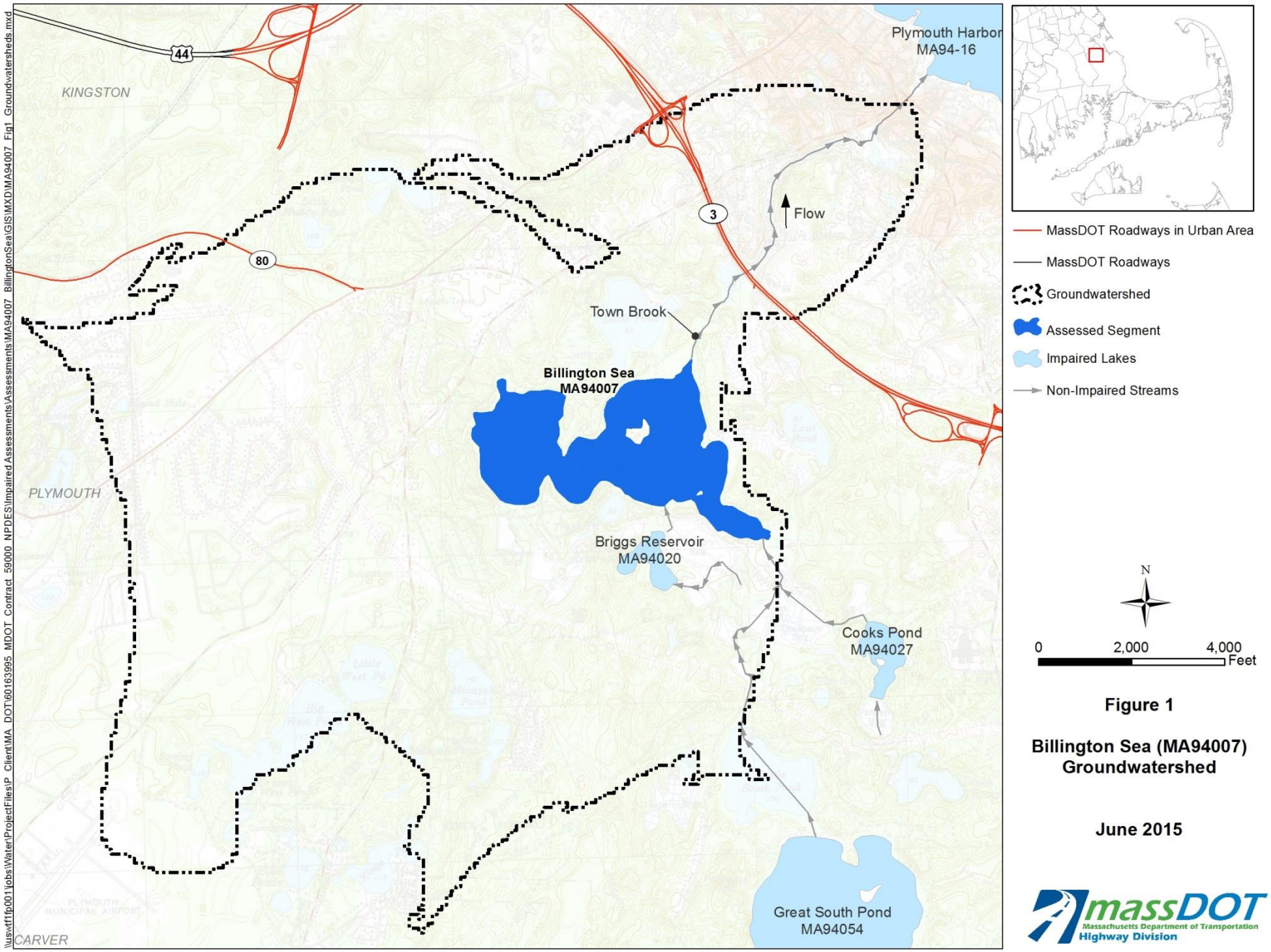

Figure 1

Billington Sea (MA94007) Groundwatershed

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Impaired Waters Assessment for Crossman Pond (MA94032)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Plants (Macrophytes)*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* [2]	
Location	Towns:	*Kingston*	
	MassDOT Roads:	*Route 80 and Route 53*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Crossman Pond (MA94032) is a water body approximately 13 acres in size located in Kingston, Massachusetts (Figure 1). Crossman Pond receives flow from an adjacent cranberry bog and discharges to Jones River (MA94-12) through Fountainhead Brook which is unimpaired at this location. Jones River ultimately discharges to Duxbury Bay (MA94-15).

Crossman Pond (MA94032) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography. [3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] Figure 1 illustrates the groundwatershed for Crossman Pond (MA94032).

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2006. *South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/94wqar3.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

MassDEP's *South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* [2] for Crossman Pond identified the Aquatic Life, Fish Consumption, Primary and Secondary Contact Recreational Uses, and Aesthetics as "not assessed", with an Alert Status identified for the Aquatic Life, Primary and Secondary Contact Recreational Uses, and Aesthetics.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Crossman Pond (MA94032) is not proposed to change.

Land use in the Crossman Pond (MA94032) groundwatershed is primarily forest, cranberry bogs and residential. MassDOT-owned property within the groundwatershed includes Route 80 and Route 53, located south and north, respectively of Crossman Pond.

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Crossman Pond is an inland lake impaired for aquatic plants (Macrophytes), which is typically related to eutrophication processes caused by excess phosphorous.[6] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Crossman Pond as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Crossman Pond. The closest MassDOT-owned property within the mapped urban area is Route 80, located approximately 1.25 miles south of Crossman Pond (Figure 1). Runoff from Route 80 is collected with catch basins which discharge to depressions near the roadway where infiltrates into the ground. Route 53 is located in the northern part of the watershed (Figure 1). Runoff from Route 53 travels through sheet-flow and discharges to the pervious area immediately next to the road where it infiltrates into the ground. No stormwater runoff from Route 80 or Route 53 discharges directly to Crossman Pond.

As defined in MassDOT's assessment methodology,[8] since MassDOT's urban property does not directly contribute stormwater runoff to Crossman Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

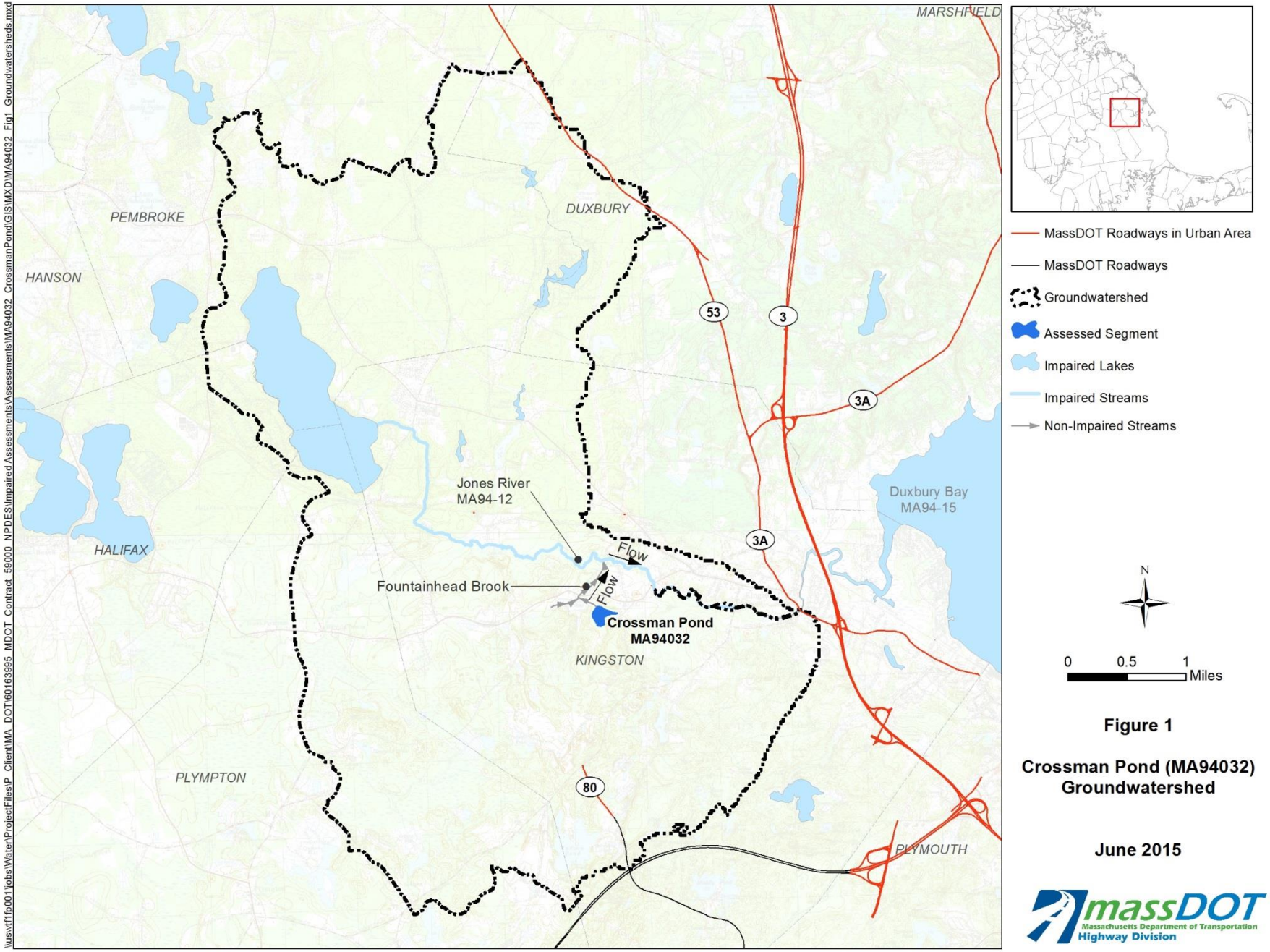

Figure 1

Crossman Pond (MA94032) Groundwatershed

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Impaired Waters Assessment for Foundry Pond (MA94038)

Summary

Impaired Water[1]	Stormwater Impairments:	*Turbidity*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2]
Location	Towns:	*Kingston*
	MassDOT Roads:	*Route 3, Route 3A, Route 44, and Route 80*
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒ No Discharge ☒

Site Description

Foundry Pond (MA94038) is a waterbody approximately 7 acres in size located in Kingston, Massachusetts (Figure 1a). Foundry Pond (MA94038) receives flow from Smelt Brook, which is not impaired at this location and originates in Smelt Pond (MA94184). The outlet of Foundry Pond discharges to another section of Smelt Brook, which is also not impaired, and ultimately discharges to Duxbury Bay (MA94-15) through Jones River (MA94-14).

Foundry Pond (MA94038) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds in Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography.[3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] Figure 1 illustrates the groundwatershed for Foundry Pond.

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2006. South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/94wqar3.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

MassDEP's *South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2] for Foundry Pond identified all Uses as "not assessed". However, the Reacreational and Aesthetic Uses are identified with an "alert" status due to sparse aquatic plants cover including non-native wetland species.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Foundry Pond (MA94038) is not proposed to change.

Land use in the Foundry Pond (MA94038) groundwatershed is primarily forest, residential, and open land. MassDOT-owned property within the groundwatershed includes Route 3, Route 3A, Route 44, and Route 80 located west, north, and south, respectively of Foundry Pond (Figure 1b).

Although MassDOT roadways are within the groundwatershed of this water body, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Foundry Pond is an inland lake impaired for turbidity which is a nutrient-related impairment. In inland lakes and ponds such as Foundry Pond, eutrophication processes are typically caused by excess phosphorous.[6] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Foundry Pond as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Foundry Pond. The closest MassDOT-owned property within the mapped urban area is Route 3A, located approximately 0.12 miles north and downstream of Foundry Pond. This road discharges downstream of Foundry Pond to a section of Smelt Brook which is not impaired at this location. Route 3 traverses the groundwatershed in a south-east to north-west direction, upstream of Foundry Pond. Route 44 is located south of Foundry Pond. The majority of the runoff from Route 44 is collected with catch basin networks and directed to eight wet ponds which are located within the groundwatershed of Foundry Pond. These wet ponds also receive runoff from a portion of Route 3. The outlets of the wet ponds do not discharge directly to Foundry Pond. Runoff from the remaining portion of Route 3 is collected with catch basins which discharge to depressions along the road where it infiltrates within the Foundry Pond groundwatershed. Route 80 is located west of Foundry Pond. Runoff from Route 80 is collected in catch basins and discharged along the road where infiltrates into the ground.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Foundry Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

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[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

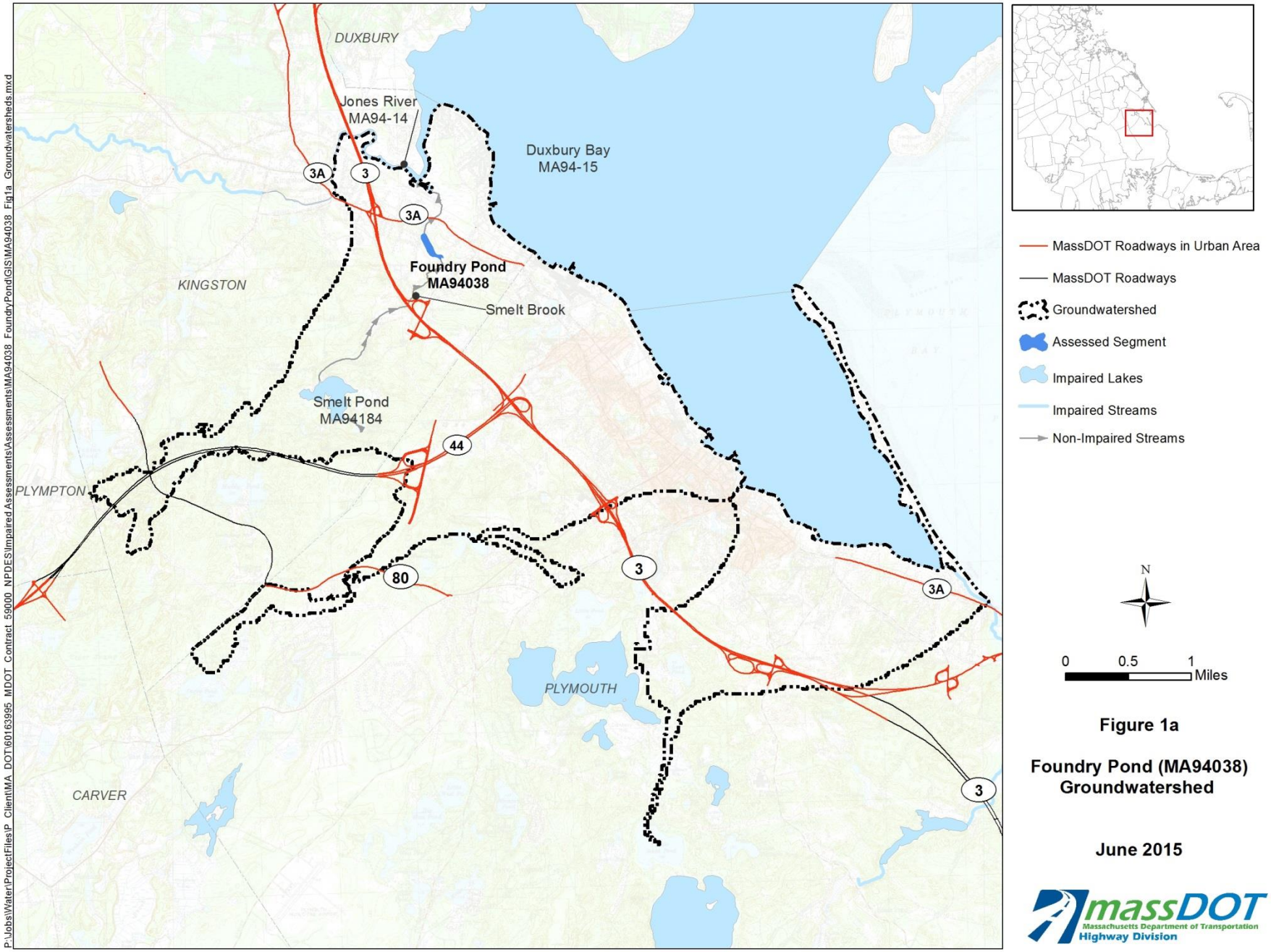

Figure 1a

Foundry Pond (MA94038) Groundwatershed

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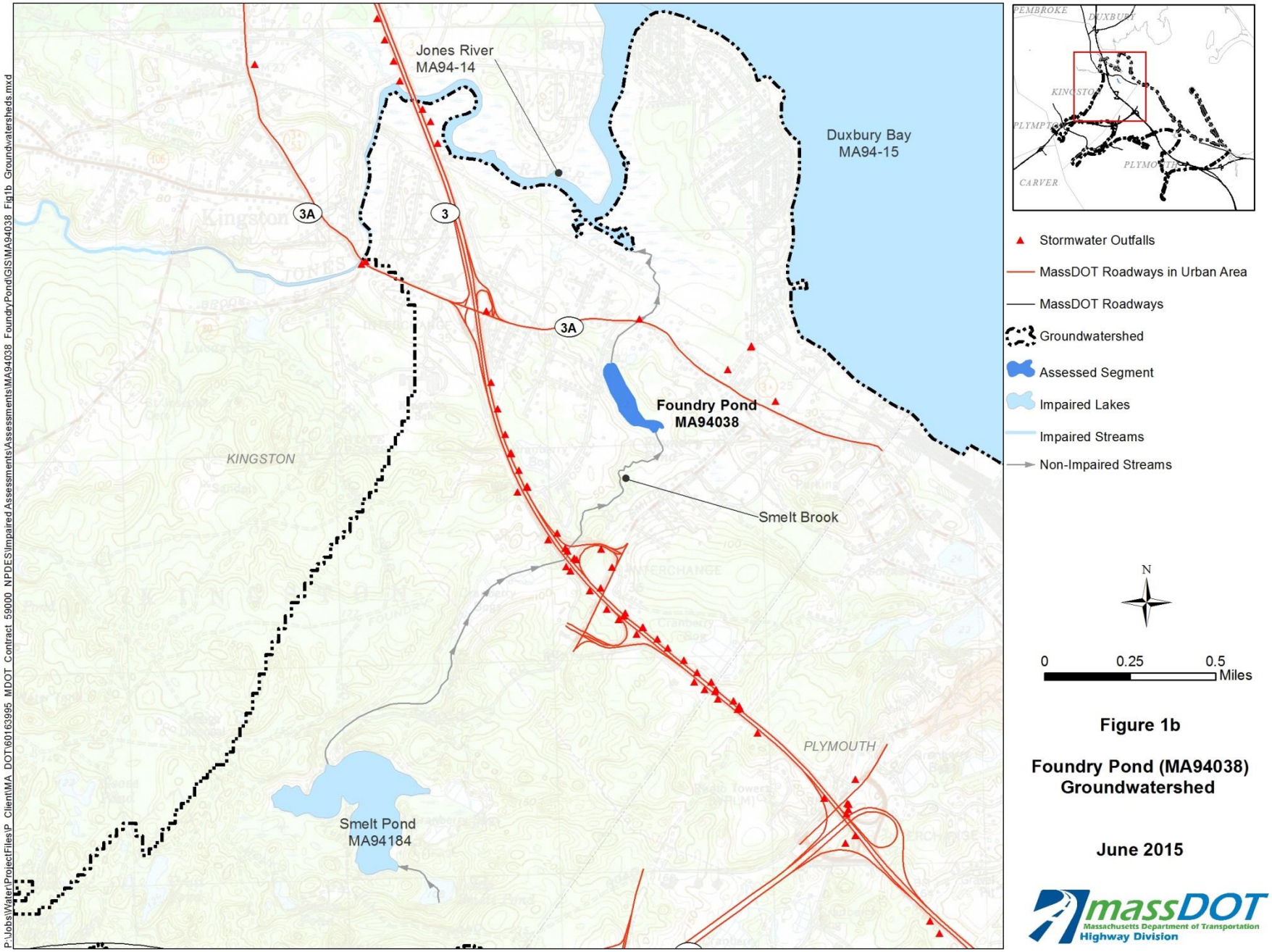

Figure 1b

Foundry Pond (MA94038) Groundwatershed

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Impaired Waters Assessment for Green Harbor River (MA94-10)

Summary

Impaired Water[1]	Stormwater Impairments:	*Excess Algal Growth; Turbidity*	
	Non-Stormwater Impairments:	*Fish-Passage Barrier; Flow Regime Alterations*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* [2]	
Location	Towns:	*Marshfield*	
	MassDOT Roads:	*Route 3 and Route 3A*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Green Harbor River (MA94-10) is a water body approximately 5.6 miles in length located in Marshfield, Massachusetts (Figure 1). Green Harbor River receives flow from Black Mountain Pond (MA94009), and two unimpaired streams: Bass Creek and Wharf Creek. Green Harbor River discharges to Green Harbor (MA94-11).

Green Harbor River (MA94-10) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography. [3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] The USGS groundwatersheds for portions of the South Shore Coast, including this impaired segment, were slightly modified by MassDEP.[2] The MassDEP

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2006. *South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/94wqar2.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

modified version was used in this assessment. Figure 1 illustrates the groundwatershed for Green Harbor River (MA94-10).

MassDEP's *South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2] identified the Aquatic Life as "impaired" due to flow regime alterations and fish passages barriers. The Primary and Secondary Contact Recreational Uses, and Aesthetics are listed as "impaired" due to turbidity and excess algal growth. The suspected causes for the impairment are elevated phosphorus from cranberry bog operations and a golf course located within the groundwatershed, changes in tidal circulation circulation/flushing, impacts from hydrostructure flow regulation/modification, and farmland (both crop and livestock). Fish Consumption for Green Harbor River is listed as "not assessed".

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Green Harbor River (MA94-10) is not proposed to change.

Land use in the Green Harbor River (MA94-10) groundwatershed is primarily forest, residential, and open lands. MassDOT-owned property within the groundwatershed includes Route 3A, located west (and upstream) of Green Harbor River (Figure 1).

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Green Harbor River is a freshwater river impaired for excess algal growth and turbidity, which are typically related to eutrophication processes caused by excess phosphorous.[6] In addition, the water quality assessment report identifies excess phosphorous as the source of the nutrient –related impairments. Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Green Harbor River as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Green Harbor River. The closest MassDOT-owned property within the mapped urban area is Route 3A, located approximately 0.5 miles west and upstream of the Green Harbor River (Figure 1). According to field observations, runoff from a section of Route 3 in the vicinity of Green Harbor Brook is collected with a network of catch basins and discharged directly to Black Mountain Pond (MA94009). Black Mountain Pond is upstream of, and hydrologically connected to Green Harbor River. Stormwater outfalls along the remaining portion of Route 3A within the watershed appear to discharge immediately adjacent to the road where runoff infiltrates into the ground. Route 3 traverses the groundwatershed in a south-north direction on the western side of the watershed and upstream of Green Harbor River. Runoff from Route 3 is collected with catch basins and discharges in depressed areas immediately near the road, where it infiltrates into the ground. Runoff from Route 3A and Route 3 does not directly discharge to Green Harbor River.

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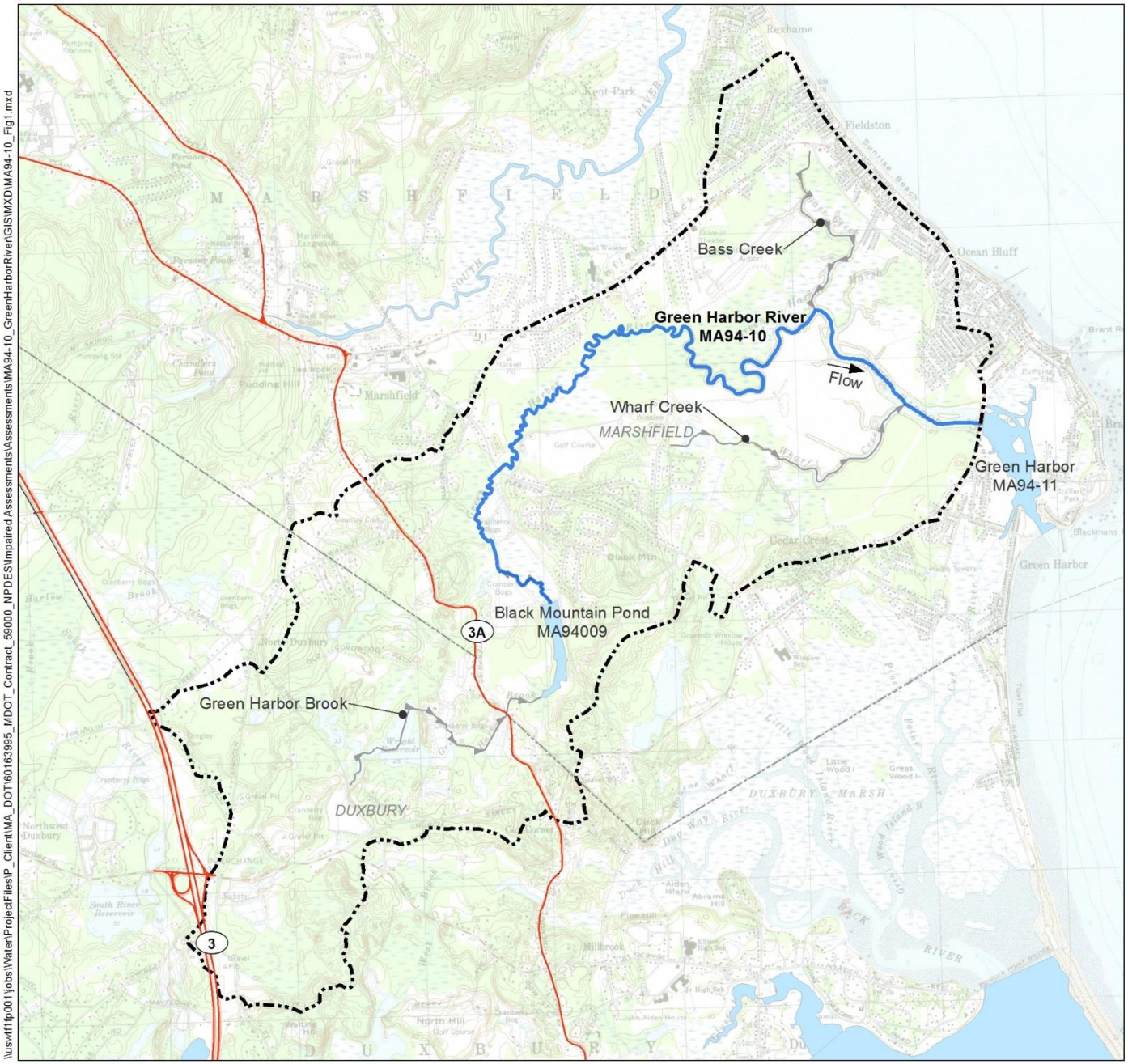
[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Green Harbor River, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf



MassDOT Roadways in Urban Area

MassDOT Roadways

Groundwatershed

Assessed Segment

Impaired Lakes

Non-impaired Streams

N

0 0.5 1 Miles

Figure 1

Green Harbor River (MA94-10) Groundwatershed

June 2015

MassDOT Massachusetts Department of Transportation Highway Division

06/08/2015

Impaired Waters Assessment for Jones River (MA94-12)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Plants (Macrophytes); Excess Algal Growth; Dissolved Oxygen; Turbidity*	
	Non-Stormwater Impairments:	*Fish-Passage Barrier; Low Flow Alterations*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2]	
Location	Towns:	*Kingston*	
	MassDOT Roads:	*Route 53*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Jones River (MA94-12) is a water body approximately 4.1 miles in length located in Kingston, Massachusetts (Figure 1). Jones River (MA94-12) originates from Silver Lake (MA94143) and ends at the Wapping Road dam. Jones River (MA94-12) receives flow from Crossman Pond (MA94032) which is impaired for phosphorus) through Fountainhead Brook (which is non-impaired at this location). Jones River (MA94-12) flows into two segments of Jones River (MA94-13 and MA94-14), and ultimately discharges to Duxbury Bay (MA94-15).

Jones River (MA94-12) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography.[3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] The USGS groundwatersheds for portions of the South Shore

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2006. South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/94wqar3.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

Coast, including this impaired segment, were slightly modified by MassDEP.[2] The MassDEP modified version was used in this assessment. Figure 1 illustrates the groundwatershed for Jones River.

MassDEP's *South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2] for Jones River identified the Aquatic Life Use as "impaired" due to low flow alteration, low dissolved oxygen, dissolved oxygen saturation, and fish passage barrier. The Fish Consumption Use is listed as "not assessed", and Primary and Secondary Contact Recreational Uses, and Aesthetics are listed as "impaired" due to excess algal and aquatic plant growth and turbidity due to flow alterations from water diversions.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Jones River (MA94-12) is not proposed to change.

Land use in the Jones River (MA94-12) groundwatershed is primarily forest, residential, and open land. MassDOT-owned property within the groundwatershed includes Route 53, located north of Jones River.

Although MassDOT roadways are within the groundwatershed of this water body, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Jones River is impaired for aquatic plants (Macrophytes), excess algal growth, dissolved oxygen, and turbidity, which are typically related to eutrophication processes caused by excess phosphorous.[6] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Jones River as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Jones River. Route 53 is located approximately 5.8 miles north of Jones River (Figure 1). Runoff from Route 53 travels through sheet-flow and discharges to the pervious area immediately next to the road where it infiltrates into the ground. No stormwater runoff from Route 53 discharges directly to Jones River.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Jones River, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

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[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, Center for Watershed Protection. 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

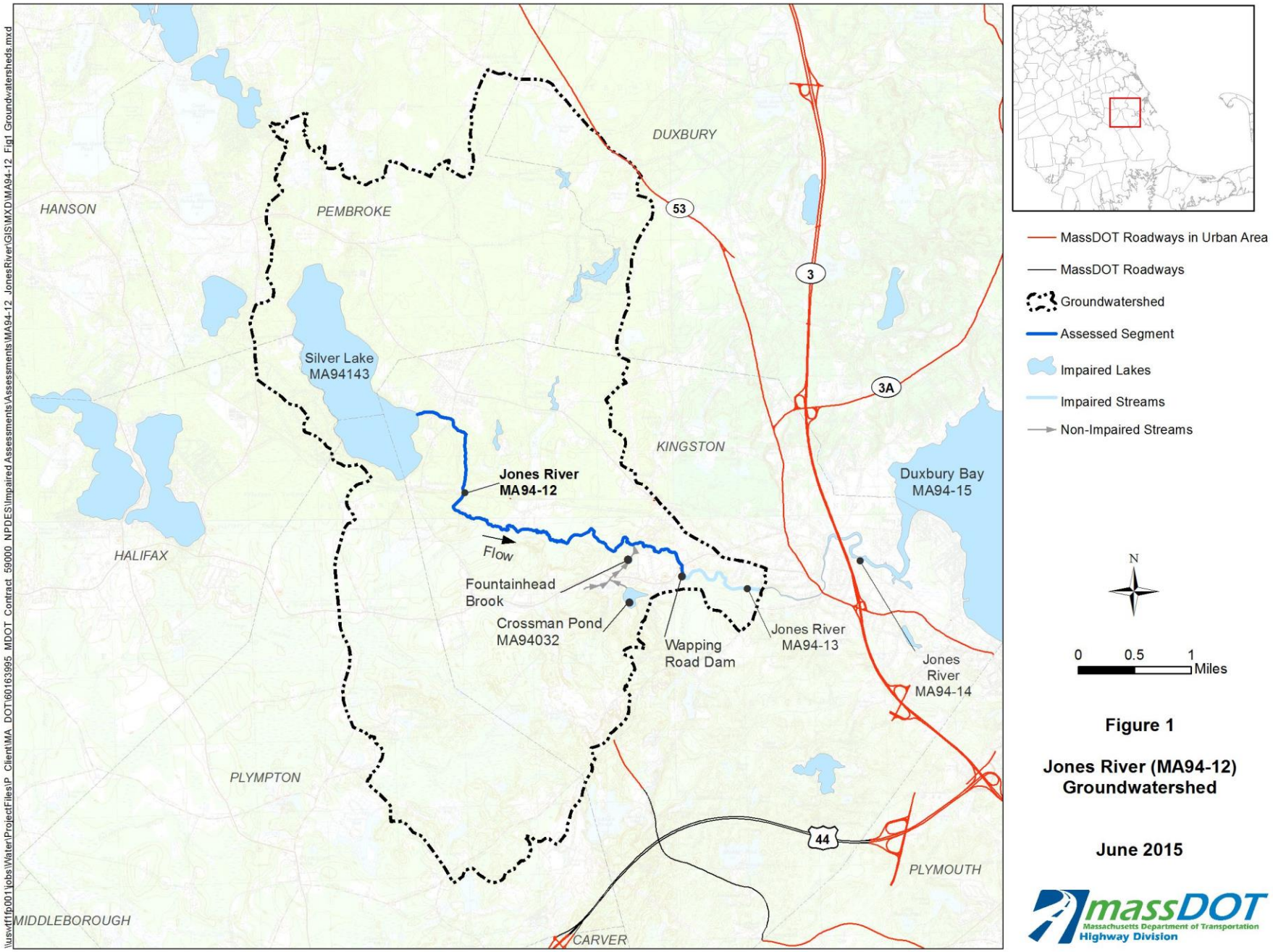

Figure 1

Jones River (MA94-12)
Groundwatershed

June 2015

massDOT
Massachusetts Department of Transportation
Highway Division

06/08/2015

Impaired Waters Assessment for Jones River (MA94-13)

Summary

Impaired Water[1]	Stormwater Impairments:	*Aquatic Plants (Macrophytes); Excess Algal Growth; Dissolved Oxygen; Turbidity*
	Non-Stormwater Impairments:	*Low Flow Alterations*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2]
Location	Towns:	*Kingston*
	MassDOT Roads:	*Route 53 and Route 80*
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒ No Discharge ☒

Site Description

Jones River (MA94-13) is a water body approximately 0.9 miles in length located in Kingston, Massachusetts (Figure 1). Jones River (MA94-13) begins at the dam near Wapping Road and ends at the dam at Elm Street. Jones River (MA94-13) is hydraulically connected with Jones River (MA94-12) and Jones River (MA94-14) and ultimately discharges to Duxbury Bay (MA94-15).

Jones River (MA94-13) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography.[3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] The USGS groundwatersheds for portions of the South Shore

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2006. South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/94wqar3.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Traveltimes to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857

[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

Coast, including this impaired segment, were slightly modified by MassDEP.[2] The MassDEP modified version was used in this assessment. Figure 1 illustrates the groundwatersed for Jones River.

MassDEP's *South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2] for Jones River identified the Aquatic Life Use as "impaired" due to low flow alteration, low dissolved oxygen, and dissolved oxygen saturation. The Fish Consumption Use is listed as "not assessed". Primary and Secondary Contact Recreational Uses, and Aesthetics are listed as "impaired" due to excess algal and aquatic plant growth and turbidity. The impairments are caused by flow alterations from water diversions.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Jones River (MA94-13) is not proposed to change.

Land use in the Jones River (MA94-13) groundwatershed is primarily forest, residential, and open land. MassDOT-owned property within the groundwatershed includes Route 80 and Route 53, located south and north, respectively of Jones River.

Although MassDOT roadways are within the groundwatershed of this water body, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Jones River is a freshwater river impaired for dissolved oxygen, turbidity, aquatic plants (Macrophytes), and excess algal growth which are typically related to eutrophication processes caused by excess phosphorous.[6] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Jones River as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Jones River (MA94-13). The closest MassDOT-owned urban property is Route 80, located approximately 1.60 miles south of Jones River (MA94-13) (Figure 1). Runoff from Route 80 is collected with catch basins which discharge to depressions near the roadway where it infiltrates into the ground. Route 53 is located approximately 5.8 miles north and upstream of Jones River (Figure 1). Runoff from Route 53 travels through sheet-flow and discharges to the pervious area immediately next to the road where it infiltrates into the ground. No stormwater runoff from Route 80 or Route 53 discharges directly to Jones River.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Jones River, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

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[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

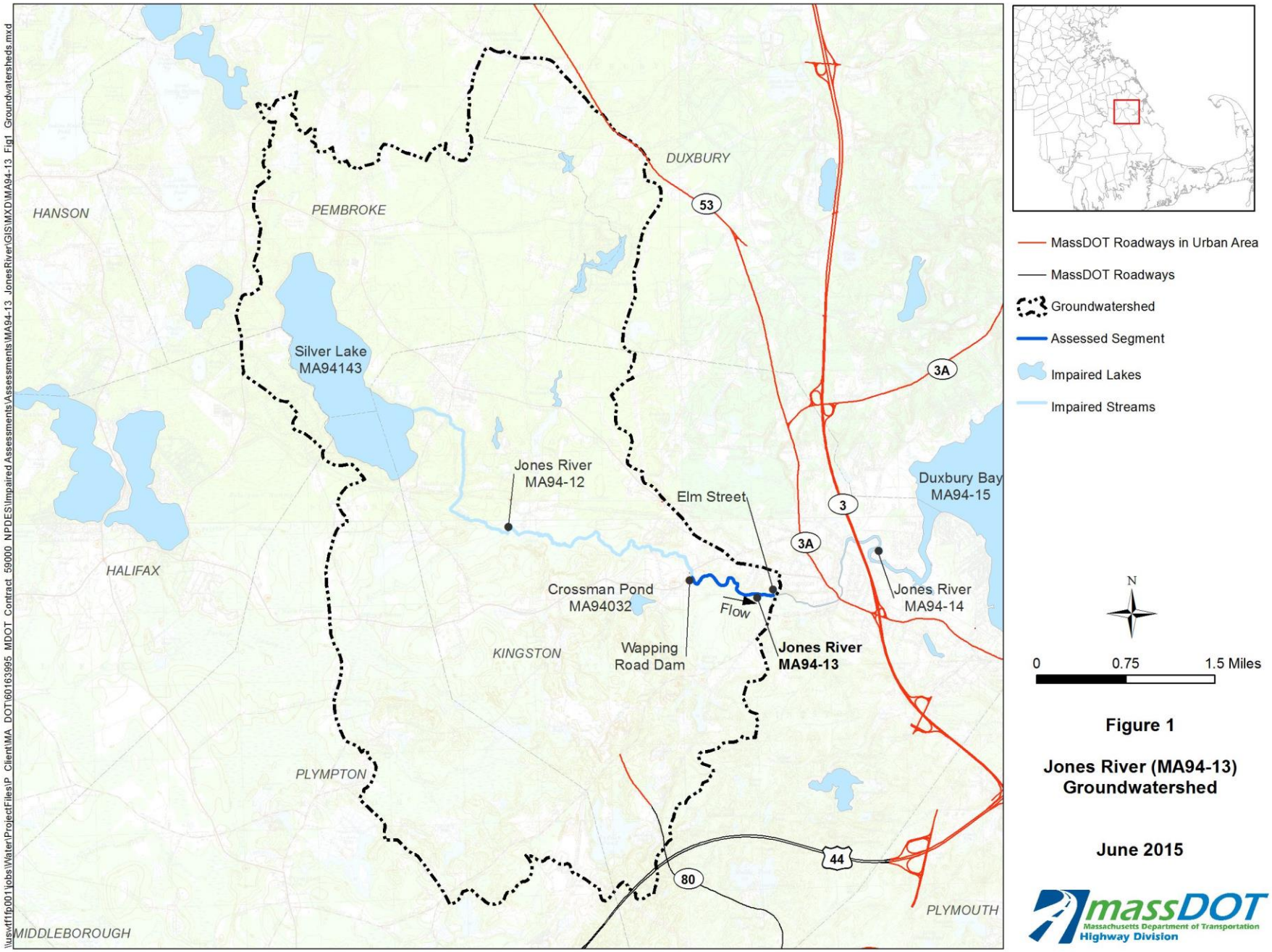

Figure 1

Jones River (MA94-13) Groundwatershed

June 2015

06/08/2015

Impaired Waters Assessment for Russell Millpond (MA94132)

Summary

Impaired Water[1]	Stormwater Impairments:	*Excess Algal Growth*
	Non-Stormwater Impairments:	*Fish-Passage Barrier*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* [2]
Location	Towns:	*Plymouth*
	MassDOT Roads:	*Route 3, Route 3A, and Plimoth Plantation Highway*
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒ No Discharge ☒

Site Description

Russell Millpond (MA94132) is a water body approximately 42 acres in size located in Plymouth, Massachusetts (Figure 1). Flow enters Russell Millpond from Eel River (MA94-23) to the south. The outflow from Russell Millpond on the north side of the Pond discharges to Eel River (MA94-23) and ultimately discharges to Plymouth Harbor (MA94-16).

Russell Millpond (MA94132) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography. [3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] Figure 1 illustrates the groundwatershed for Russell Millpond (MA94132).

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, March 2006. *South Shore Coastal Watersheds 2001 Water Quality Assessment Report Lakes* Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/94wqar3.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

MassDEP's *South Shore Coastal Watersheds 2001 Water Quality Assessment Report* [2] for Russell Millpond identified the Aquatic Life, Primary and Secondary Contact Recreational Uses and Aesthetics as "impaired" due to excess algal growth and Fish Consumption as "not assessed".

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Russell Millpond (MA94132) is not proposed to change.

Land use in the Russell Millpond (MA94132) groundwatershed is primarily forest, commercial, residential, and recreational (golfing). MassDOT-owned property within the groundwatershed includes Route 3, Route 3A, and Plimoth Plantation Highway, located north of Russell Millpond (Figure 1).

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Russell Millpond is an inland lake impaired for excess algal growth, which is typically related to eutrophication processes caused by excess phosphorous.[6] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Russell Millpond as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Russell Millpond. Plimoth Plantation Highway is located north of Russell Millpond, and connects Route 3A with Route 3. Runoff from Plimoth Plantation Highway is collected with catch basin networks that discharge in the immediate vicinity of the roadway where it infiltrates into the ground. A section of Route 3 which is within the mapped urban area is located approximately 1 mile north of the Russell Millpond outlet (Figure 1). Runoff from this section of Route 3 is collected with catch basin networks that discharge in the immediate vicinity of the roadway where it infiltrates into the ground. The remaining portion of Route 3 exits the mapped urban area and is therefore considered non-contributing. Route 3A, and the western portion of Plimoth Plantation Highway discharges to Eel River (MA94-23), downstream of Rusell Millpond. No stormwater runoff from Route 3, Route 3A or Plimoth Plantation Highway discharges directly to Russell Millpond.

As defined in MassDOT's assessment methodology,[8] since the MassDOT's urban property does not directly contribute stormwater runoff to Russell Millpond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

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[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

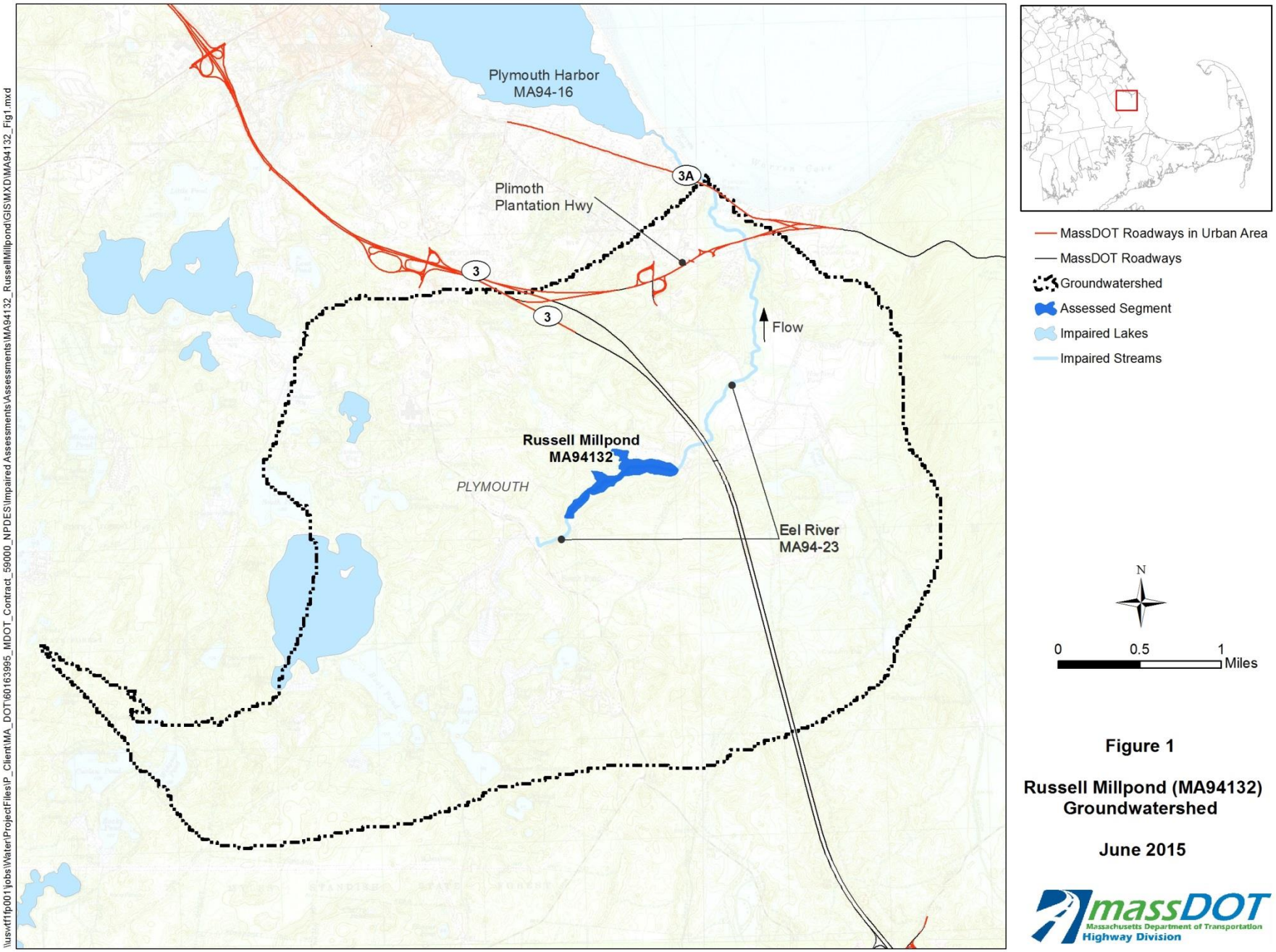

Figure 1

Russell Millpond (MA94132) Groundwatershed

June 2015

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06/08/2015

Impaired Waters Assessment for Crane Brook Bog Pond (MA95033)

Summary

Impaired Water[1]	Stormwater Impairments:	*Non-Native Aquatic Plants; Excess Algal Growth; Total Phosphorus*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*Buzzards Bay Watershed 2000 Water Quality Assessment Report*[2]
Location	Towns:	*Carver*
	MassDOT Roads:	*I-495, I-195, Route 28, and Route 58*
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒ No Discharge ☒

Site Description

Crane Brook Bog Pond (MA95033) is a water body approximately 37 acres in size located in Carver, Massachusetts (Figure 1a). The outlet of Crane Brook Bog Pond discharges to Weweantic River which is unimpaired at this location. Crane Brook Bog Pond is hydraulically connected with Tremont Mill Pond (MA95150) which is located downstream of Crane Brook Bog Pond.

Crane Brook Bog Pond (MA95033) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography.[3] The groundwatersheds for portions of Buzzards Bay, including this impaired segment, were provided by the Buzzards Bay National Estuaries Program (BBNEP)[4] as modified from the USGS groundwater delineations developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,5]

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, November 2003. Buzzards Bay Watershed 2000 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/95wqar1.pdf

[3] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

[4] BBNEP, 2014. Shapefile coverage of watershed boundaries via email from Joe Costa on September 9, 2014.

[5] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

MassDEP's *Buzzards Bay Watershed Water Quality Assessment Report* [2] for Crane Brook Bog Pond identified the Aquatic Life, Primary and Secondary Contact Recreational Uses and Aesthetics as "impaired" due to phosphate and excess algal growth, and Fish Consumption as "not assessed".

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[6] The condition Crane Brook Bog Pond (MA95033) is not proposed to change.

Land use in the Crane Brook Bog Pond (MA95033) groundwatershed is primarily forest and cranberry bogs. MassDOT-owned property within the groundwatershed includes I-495, I-195, Route 28, and Route 58, located south of Crane Brook Bog Pond (Figure 1b).

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Crane Brook Bog Pond is an inland lake impaired for non-native aquatic plants, excess algal growth and total phosphorus, all of which are typically related to eutrophication processes caused by excess phosphorous.[7] In addition, the *Buzzards Bay Watershed Water Quality Assessment Report* [2] notes that phosphorus is a cause of the impairments. Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[8] Therefore, MassDOT has only considered a direct surface runoff to Crane Brook Bog Pond as contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Crane Brook Bog Pond. All MassDOT roads in the groundwatershed either discharge stormwater downstream of Crane Brook Bog Pond, or discharge to catchbasins or paved spillways that discharge in the immediate vicinity of the road, where stormwater runoff infiltrates into the ground. Route 58 is located approximately 0.65 miles south of Crane Brook Bog Pond (Figure 1a), and, based on surface water bodies flow, discharges downstream of the Crane Brook Bog Pond outlet. I-495 is a divided highway traversing the groundwatershed in an east- west direction, approximatively 0.9 miles south of Crane Brook Bog Pond. Route 28 is a two lane road traversing the groundwatershed in a west- east direction, approximatively 1.1 miles south of Crane Brook Bog Pond. Runoff from a portion of Route 28 at the eastern side of the watershed discharges to Tremont Mill Pond (MA95150) which is an impaired waterbody for Non-Native Aquatic Plants. I-195 traverses the groundwatershed in a north-south direction, approximatively 2.6 miles south of Crane Brook Bog Pond. No runoff from MassDOT property within the groundwatershed discharges directly to Crane Brook Bog Pond.

As defined in MassDOT's assessment methodology,[9] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Crane Brook Bog Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to

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[6] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[7] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[8] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[9] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

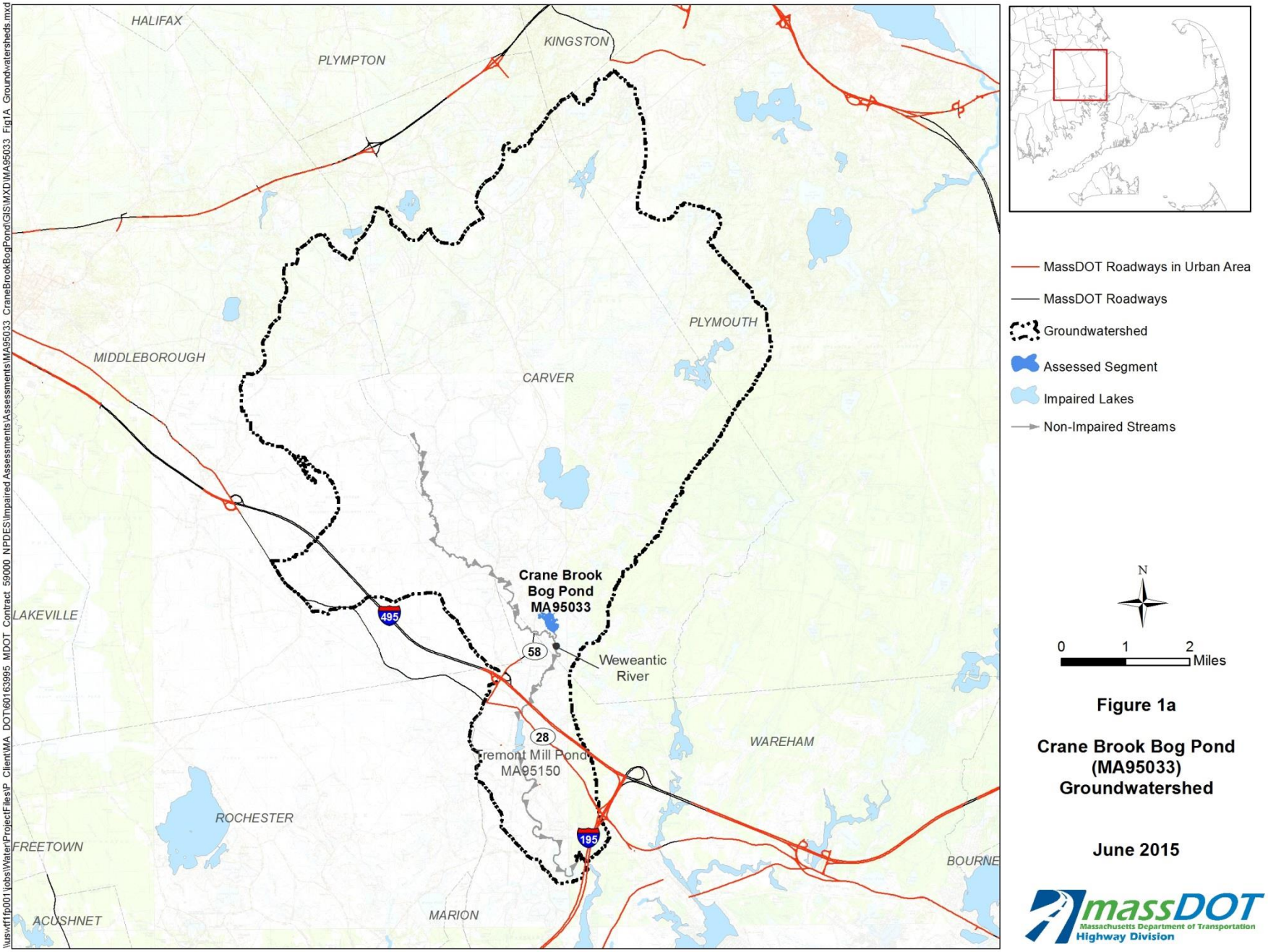

Figure 1a

Crane Brook Bog Pond (MA95033) Groundwatershed

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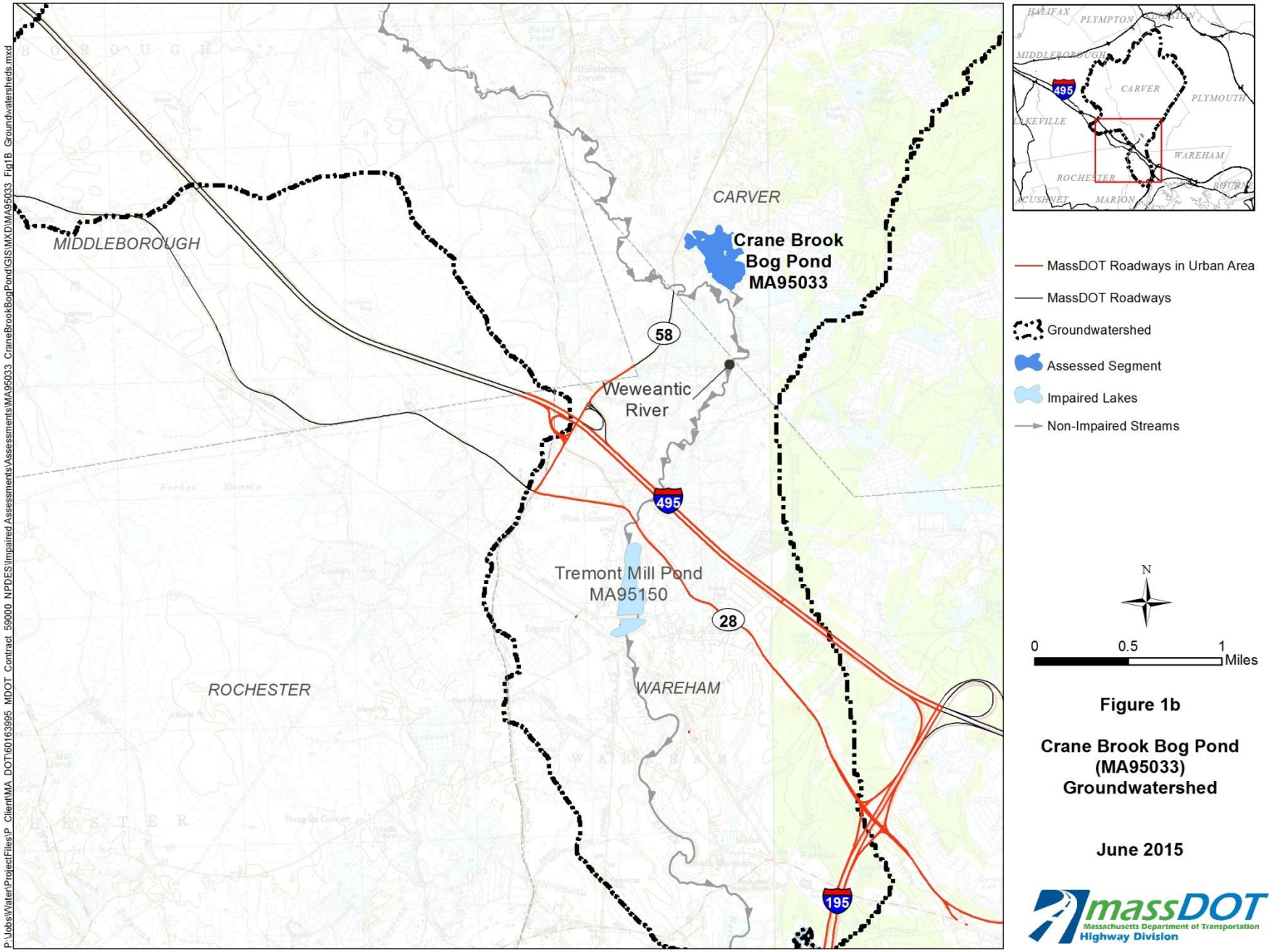

Figure 1b

Crane Brook Bog Pond (MA95033) Groundwatershed

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Impaired Waters Assessment for Sippican River (MA95-06)

Summary

Impaired Water[1]	Impairments:	Stormwater:	*Chlorophyll-a, Dissolved Oxygen*
		Non-Stormwater:[2]	*Fish-Passage Barrier*
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Buzzards Bay 2000 Water Quality Assessment Report*[3]	
Location	Towns:	*Rochester, Marion, Wareham*	
	MassDOT Roads:	*Route 105*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

This 2.94 mile long segment of the Sippican River (MA95-06) is 2.94 miles long begins at its outlet at Leonards Pond (MA95080) in Rochester, Massachusetts and flows southerly into Hathaway Pond (MA51059). It then flows easterly from Hathaway Pond where the segment ends at Country Road in Marion/Wareham where it flows into the eastern segment of the Sippican River (MA95-07). The total and subwatershed for the Sippican River are shown on Figures 1A and 1B, respectively. The subwatershed has a drainage area of approximately 3.9 square miles. Based on a review of aerial imagery, land use in the subwatershed consists of undeveloped forest, cranberry bogs, residential development and transportation (I-195 and Route 105).

According to MassDEP's *Buzzards Bay 2000 Water Quality Assessment Report,* there are approximately 1,990 acres of cranberry bog open space in the Sippican River subwatershed, which are estimated to use 17.77 million gallons of water per day.[3] The towns of Marion, Rochester, and Wareham are Phase II communities that have NPDES Municipal (MS4) permits for their drainage systems.

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDOT, December 2012. Impaired Waters Assessment for Impaired Waters with Impairments Unrelated to Stormwater. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/impairedWaters/Year3/Year3_ImpairedWatersAssessment_1.pdf#page=308

[3] MassDEP, 2003. Buzzards Bay 2000 Water Quality Assessment Report. Available At: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/95wqar1.pdf

MassDEP's *Buzzards Bay 2000 Water Quality Assessment Report* for Sippican River identified the Aquatic Life Use with an "alert" status because of the numerous cranberry bog operations in the watershed, which may affect instream flows and the lack of anadromous fish passage at the dams.[3] All other uses were not assessed.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[4] The condition of Sippican River is not proposed to change.

Based on GIS data, review of aerial imagery, and a site visit, it was determined that stormwater from MassDOT property does not discharge directly to Sippican River. The nearest MassDOT-owned road, Route 105, briefly approaches within 300 feet of the west-east trending Sippican River but is generally greater than1,000 feet away from the river. Stormwater runoff from Route 105, which does not have a closed drainage system, discharges via sheetflow into the surrounding wetlands located immediately off the road. Stormwater flows into these wetlands which provide water quality treatment prior to the runoff flowing into a non-impaired unnamed stream that flows into the Sippican River.

As defined in MassDOT's assessment methodology,[5] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Sippican River, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[4] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[5] MassDOT, 6 April, 2011. Description of MassDOT's Application of Impervious Cover Method in BMP 7U (MassDOT Application of IC Method). http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/IC_MethodApplication2011Apr6.pdf

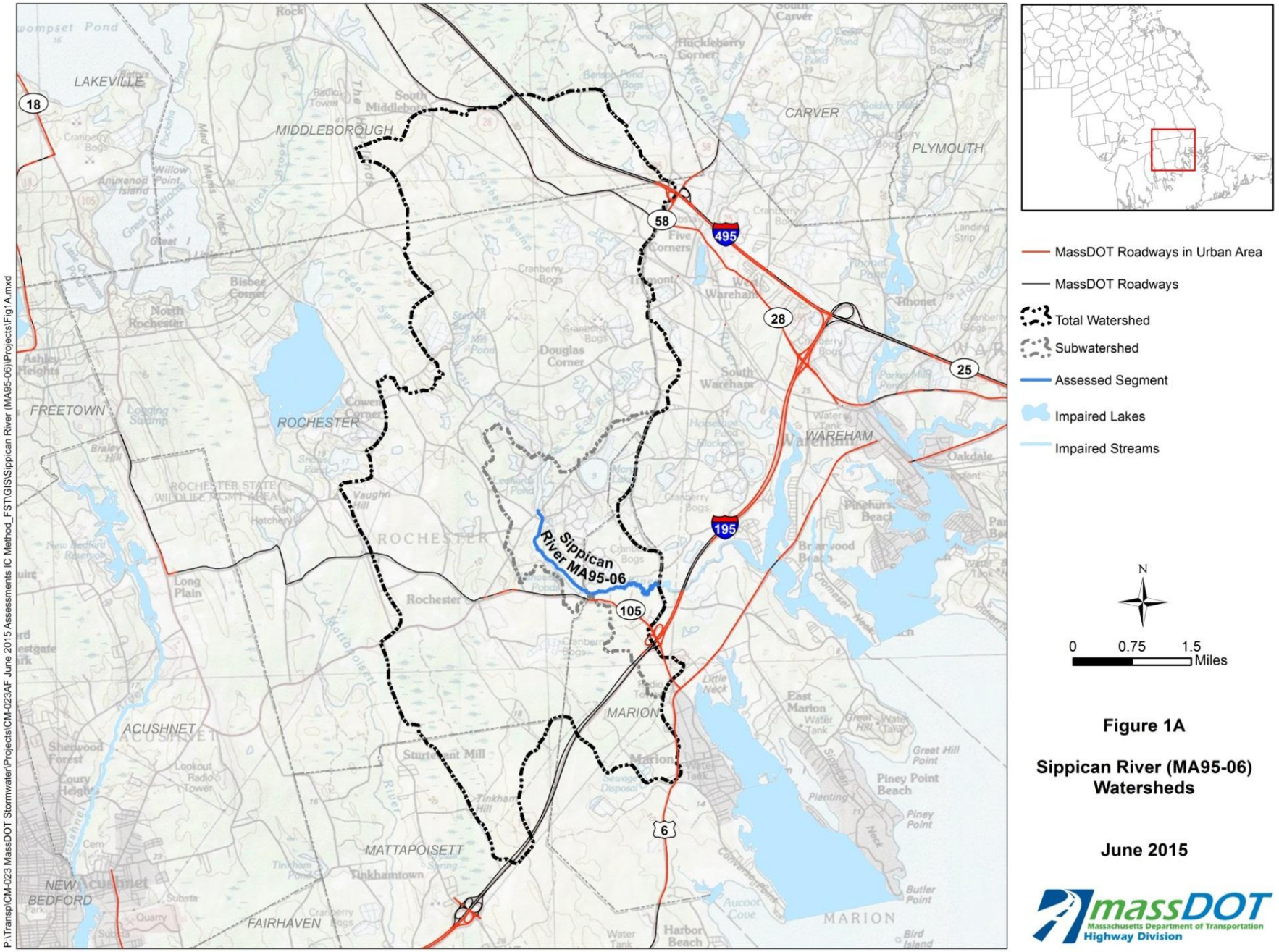

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Figure 1A

Sippican River (MA95-06) Watersheds

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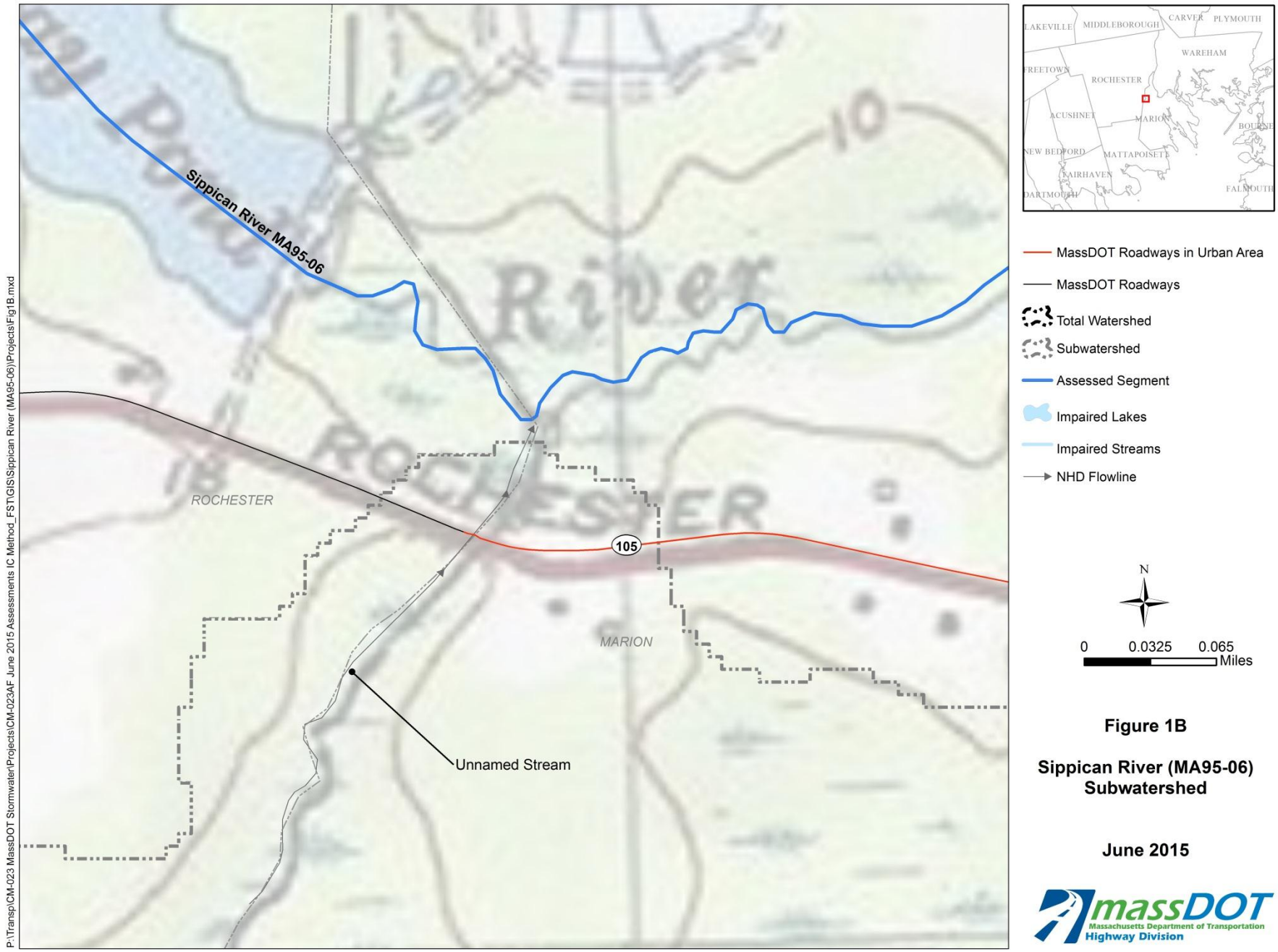

Figure 1B

Sippican River (MA95-06) Subwatershed

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Impaired Waters Assessment for Tihonet Pond (MA95146)

Summary

Impaired Water[1]	Stormwater Impairments:	*Dissolved Oxygen*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Buzzards Bay Watershed 2000 Water Quality Assessment Report*[2]	
Location	Towns:	*Wareham*	
	MassDOT Roads:	*I-495, I-195, and Route 28*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Tihonet Pond (MA95146) is a water body approximately 86 acres in size located in Wareham, Massachusetts (Figure 1a). Flow enters Tihonet Pond from the Wankinco River (which is not impaired at this location) to the north. The outflow from Tihonet Pond on the south side of the pond flows to Parker Mills Pond (MA95115).

Tihonet Pond (MA95146) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography.[3] The groundwatersheds for portions of Buzzards Bay, including this impaired segment, were provided by the Buzzards Bay National Estuaries Program (BBNEP)[4] as modified from the USGS groundwater delineations developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,5]

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[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, November 2003. Buzzards Bay Watershed 2000 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/95wqar1.pdf

[3] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

[4] BBNEP, 2014. Shapefile coverage of watershed boundaries via email from Joe Costa on September 9, 2014.

[5] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

MassDEP's *Buzzards Bay Watershed Water Quality Assessment Report*[2] for Tihonet Pond identified the Aquatic Life, Fish Consumption, and Primary and Secondary Contact Recreational Uses as "not assessed".

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[6] The condition of Tihonet Pond (MA95146) is not proposed to change.

Land use in the Tihonet Pond (MA95146) groundwatershed is primarily forest and cranberry bogs. MassDOT-owned property within the groundwatershed includes I-495, I-195, and Route 28, located south of Tihonet Pond (Figure 1b).

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Tihonet Pond is an inland lake impaired for dissolved oxygen, which is typically related to eutrophication processes caused by excess phosphorous.[7] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[8] Therefore, MassDOT has only considered direct surface runoff to Tihonet Pond as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Tihonet Pond. Based on surface water bodies flow, I-495, I-195 and Route 28 discharge downstream of the Tihonet Pond outlet. I-495 is located approximately 0.75 miles south of Tihonet Pond (Figure 1A). Runoff from I-195 is collected with catch basin networks which discharge to depressed areas immediately near the roadway where it infiltrates into the ground. I-495 traverses the groundwatershed in an east-west direction, approximatively 0.5 miles south of Tihonet Pond. Runoff from the urbanized portion of I-495 is collected with catch basins which discharge to depressed areas near the road, or travels through sheet flow and discharges through paved spillways to the pervious area near the road where it infiltrates into the ground. A portion of I-495 is considered as direct discharge to Parker Mills Pond (MA95115) which is impaired for total phosphorus. It should be noted that although the area between the I-495 interchange at the western edge of the groundwatershed boundary and the eastern boundary of the groundwatershed in the vicinity of Harlow Brook is not within the mapped urban area and therefore not regulated under the MS4 permit, it has been included in the assessment as road to be evaluated for direct discharges due to is close proximity to the urban area immediately to the west and to the east of this section of road. Route 28 traverses the groundwatershed in an east-west direction, approximatively 1.5 miles south of Tihonet Pond. Runoff from Route 28 within the groundwatershed boundaries discharges to Parker Mills Pond (MA95115) through paved spillways. According to field observations, no stormwater runoff from I-495, I-195 and Route 28 within the groundwatershed boundaries discharges directly to Tihonet Pond.

As defined in MassDOT's assessment methodology,[9] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Tihonet Pond, further assessment of this water body

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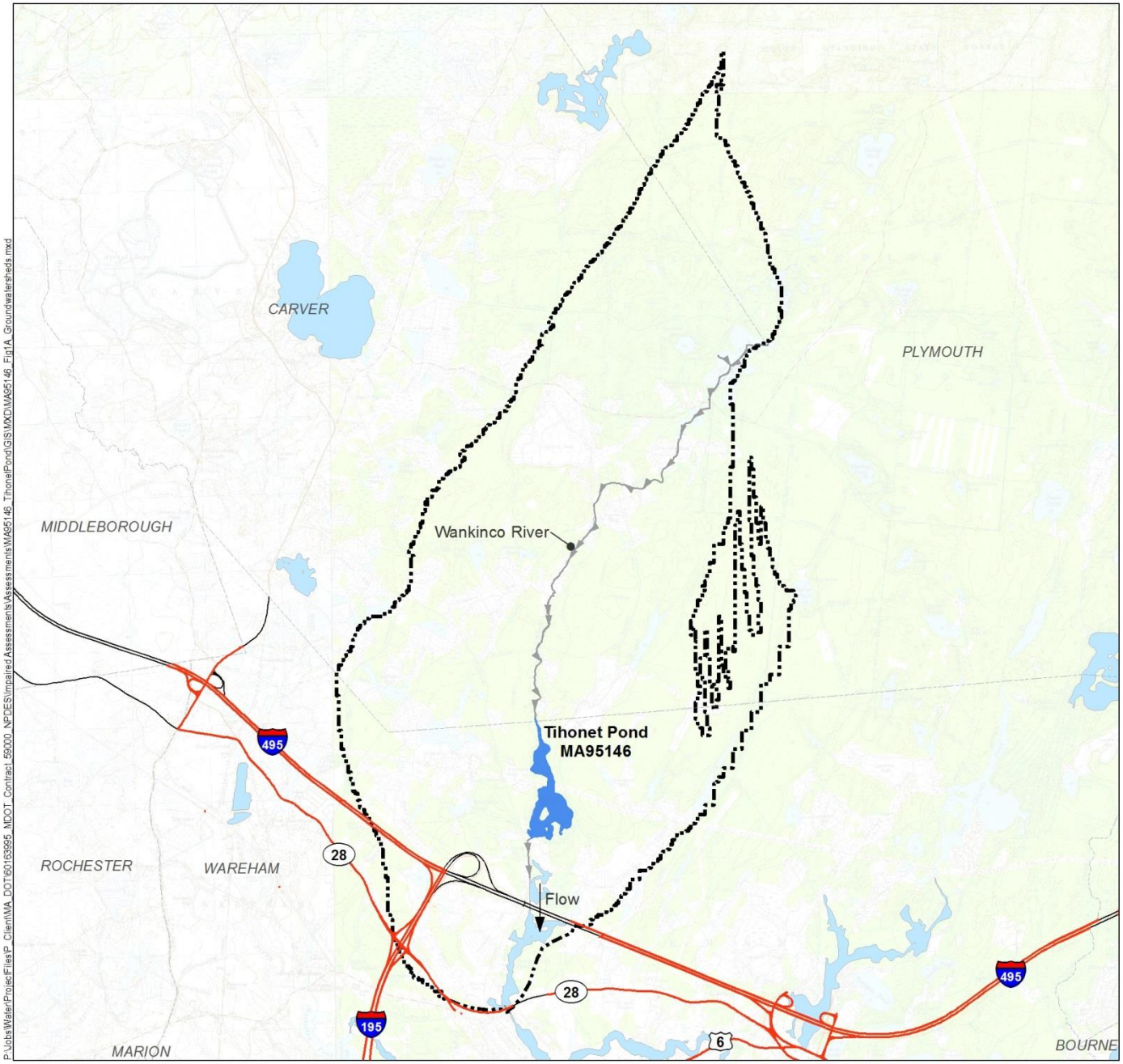
[6] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[7] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[8] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[9] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.



MassDOT Roadways in Urban Area

MassDOT Roadways

Groundwatershed

Assessed Segment

Impaired Lakes

Non-Impaired Streams

N

0 0.5 1 Miles

Figure 1a

Tihonet Pond (MA95146) Groundwatershed

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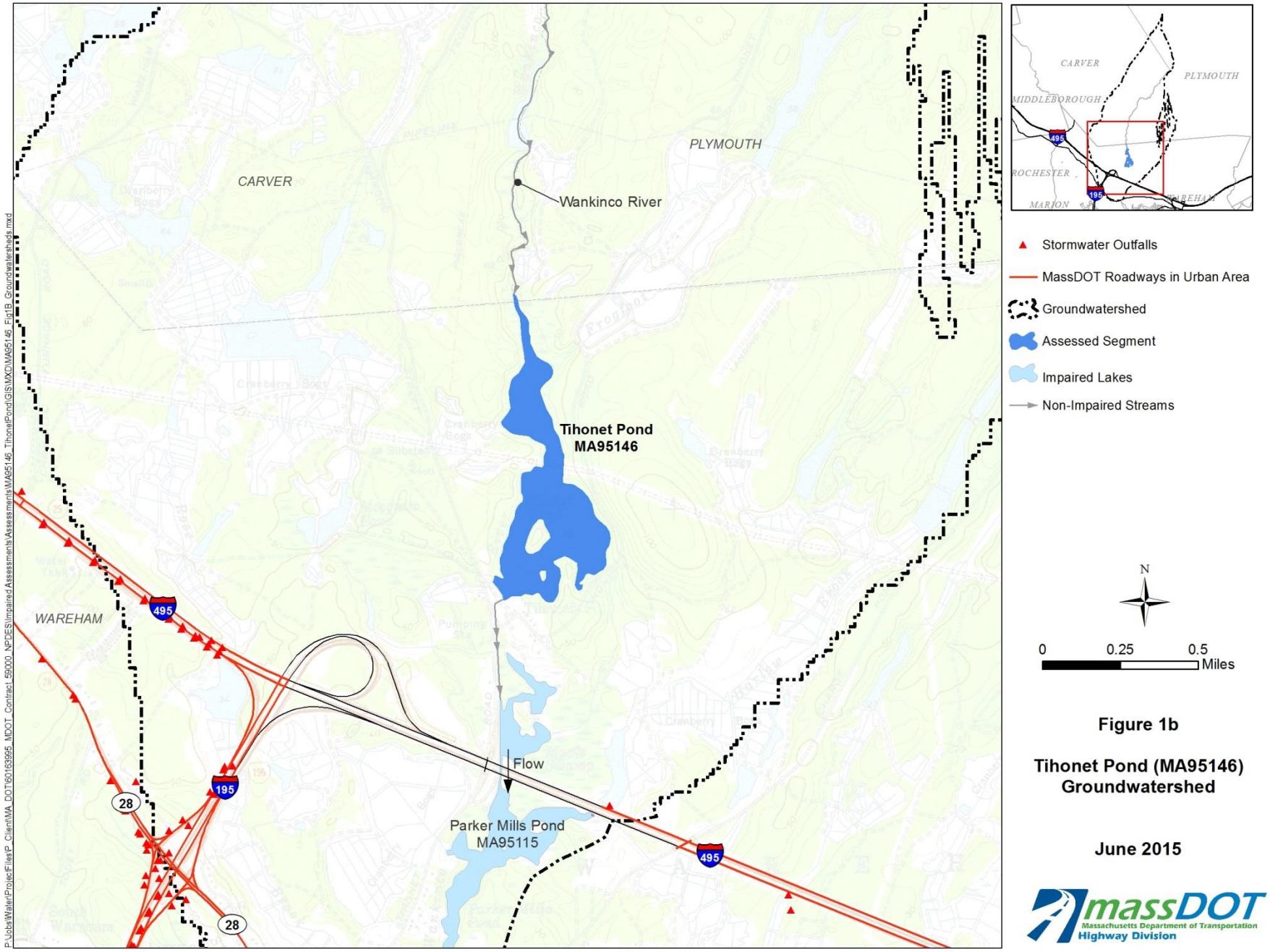

Figure 1b

Tihonet Pond (MA95146) Groundwatershed

June 2015

6/08/2015

Impaired Waters Assessment for East Branch Westport River (MA95-41)

Summary

Impaired Water[1]	Stormwater Impairments:	*Estuarine Bioassessment, Fecal Coliform, Total Nitrogen*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Buzzards Bay Watershed 2000 Water Quality Assessment Report*[2]	
Location	Towns:	*Westport*	
	MassDOT Roads:	*Route 88, Route 177*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

The East Branch Westport River (MA95-41) includes the estuarine embayment whose southern end (the mouth) is a line just west of the Normand Edward Fontaine Bridge (Route 88 over East Branch Westport River). The embayment extends north over seven miles to the northern terminus at Old County Road Bridge. This segment has an area of 2.65 acres, is tidal, and drains approximately 58.4 square miles. The total and subwatershed for the East Branch Westport River are shown on Figures 1A and 1B, respectively. Land use in the subwatershed is undeveloped forest and lightly developed residential.

According to the MassDEP's *Buzzards Bay Watershed 2000 Water Quality Assessment Report* [2] there are nearly 170 acres of cranberry bogs in the subwatershed, which are estimated to use 1.51 million gallons of water per day. The Town of Westport's stormwater discharges are regulated under a NPDES Phase II Small MS4 General Permit (MA041174). F L Tripp & Sons Inc. has a general industrial stormwater permit to discharge in this watershed.

The MassDEP's *Buzzards Bay Watershed 2000 Water Quality Assessment Report* identified the Aquatic Life use as "impaired" due to estuarine boiassessment (decline of eelgrass bed habitat). The suspected sources for the Aquatic Life Use are on-site septic systems and changes in tidal circulation/flushing. The majority of the segment is identified as "impaired" for the Shellfish Harvesting, Primary Contact, and Secondary Contact Uses (small portions are classified as "support"

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, November 2003. Buzzards Bay Watershed 2000 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/95wqar1.pdf

for these uses) due to fecal coliform bacteria. The known sources of these impairments include animal feeding operation, dairy outside milk parlor area, grazing in riparian zone, and municipal separate storm sewer systems. The suspected sources are on-site septic systems and highway/road runoff. The Fish Consumption and Aesthetics Uses were not assessed.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[3] The condition of East Branch Westport River is not proposed to change.

After desktop and field review, it was determined that MassDOT property does not discharge to East Branch Westport River. Based on GIS data, review of aerial imagery, and field review, it was determined that Route 88 spans the East Branch Westport River via the Normand Edward Fontaine Bridge, but this location is not within the designated urban area. Route 88 parallels the western side of the north-south trending estuary at an average distance of approximately 2,500 feet. Stormwater from Route 88 discharges to the impaired Snell Creek (MA95-44), Kirby Brook (non-impaired) and other unnamed tributary streams prior to discharge to the East Branch Westport River.

Several small sections of Route 88 are designated as urban areas (Figure 1B), but none of these roadway sections are considered to be directly discharging to the East Branch Westport River due to the great distance (>2,500 feet) between the discharge location and the East Branch Westport River. Route 88 does not have a closed drainage system and stormwater appears to flow overland and infiltrate into the area adjacent to the roadway.

A portion of Route 177 is also within the subwatershed; more than 1.6 miles from East Branch Westport River (MA95-41) and it discharges to a different segment of East Branch Westport River (MA95-40).

As defined in MassDOT's assessment methodologies,[4] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to East Branch Westport River, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[3] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[4] MassDOT, 6 April, 2011. Description of MassDOT's Application of Impervious Cover Method in BMP 7U (MassDOT Application of IC Method). http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/IC_MethodApplication2011Apr6.pdf

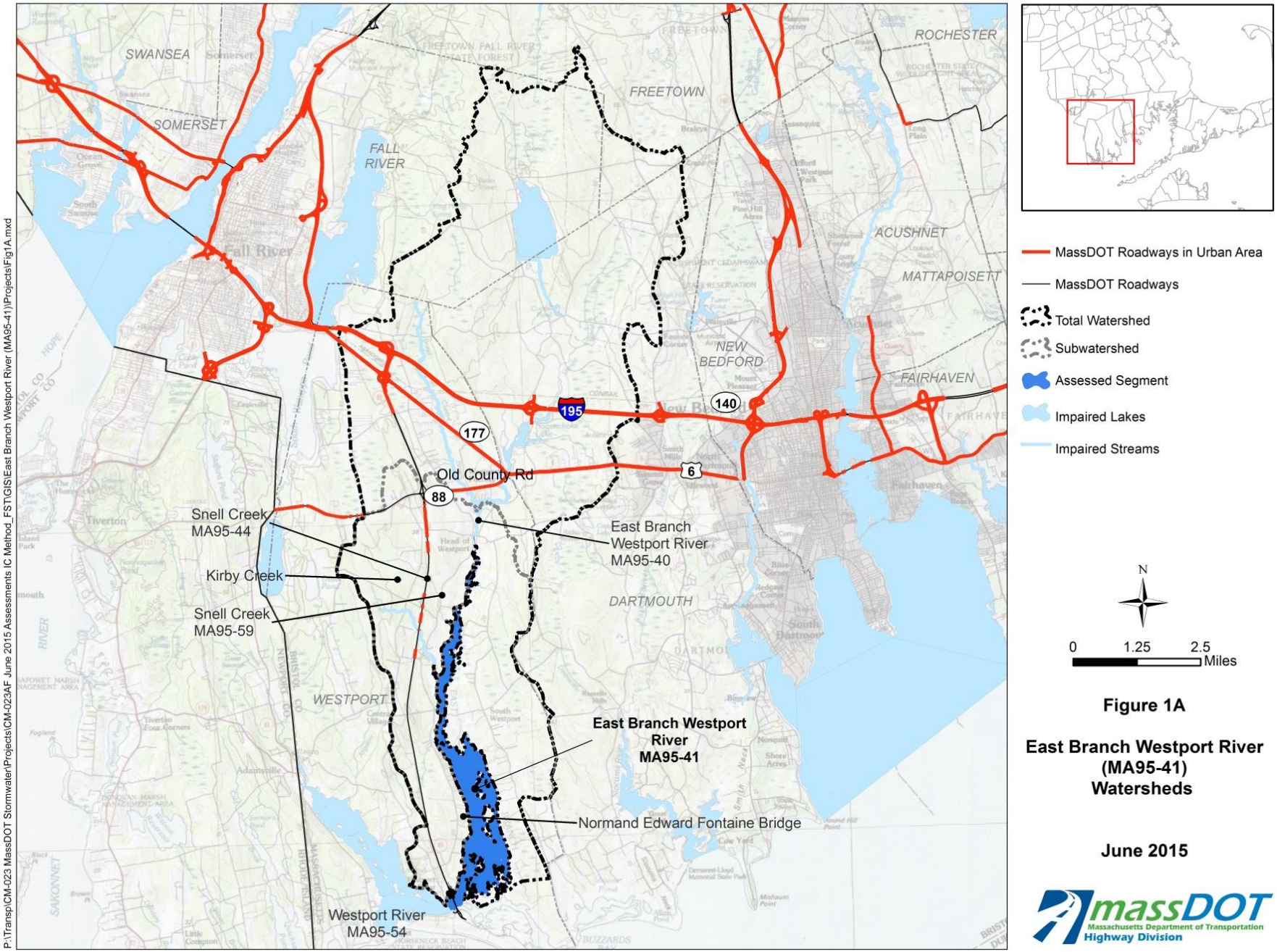

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Figure 1A

East Branch Westport River (MA95-41) Watersheds

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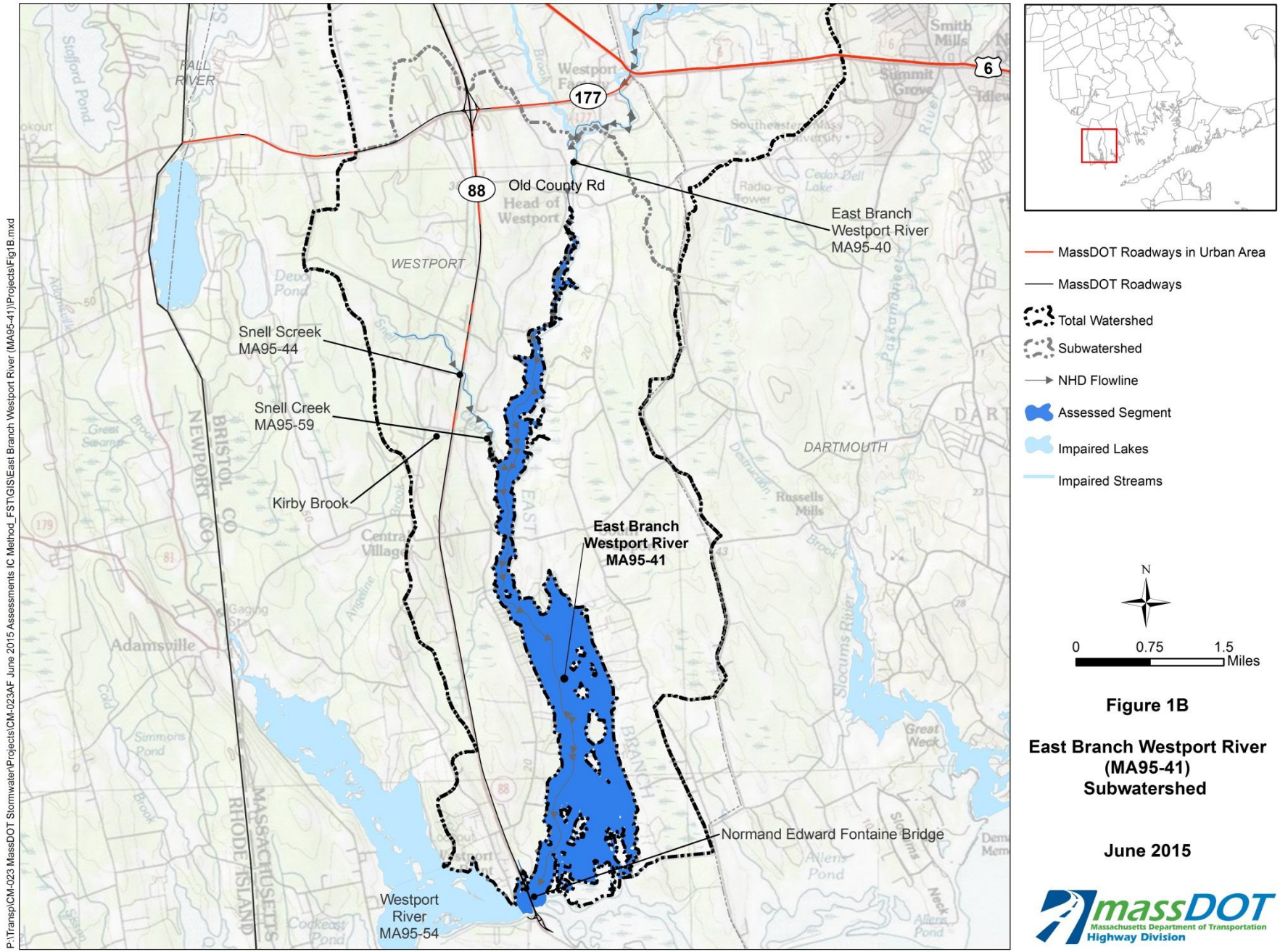

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Figure 1B

East Branch Westport River (MA95-41) Subwatershed

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Impaired Waters Assessment for Great Pond (MA96115)

Summary

Impaired Water[1]	Stormwater Impairments:	*Chlorophyll-a, Dissolved Oxygen, Phosphorus (total)*
	Category:	*5 (Waters requiring a TMDL)*
	Final TMDLs:	*None*
	WQ Assessment:	*Cape Cod Coastal Drainage Areas 2004-2008 Water Quality Assessment Report* [2]
Location	Towns:	*Eastham*
	MassDOT Roads:	*Route 6*
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒ No Discharge ☒

Site Description

Great Pond (MA96115) is a 109 acre pond located in Eastham, Massachusetts. Great Pond is hydraulically connected with an unnamed pond, located east of Great Pond and west of Route 6. Great Pond discharges to Herring Brook, and ultimately discharges to Cape Cod Bay (Figure 1).

Great Pond (MA96115) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography. [3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] Figure 1 illustrates the groundwatershed for Great Pond (MA96115).

MassDEP's Water Quality Assessment Report titled *"Cape Cod Coastal Drainage Areas, 2004 – 2008 Surface Water Quality Assessment Report"* identifies the Aquatic Life Use as "Impaired" and

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, May 2011. Cape Cod Coastal Drainage Areas 2004-2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/96wqar12.pdf

[3] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

[4] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

the Secondary Contract and Aesthetics Uses are 'supported' for Great Pond (MA96115). The Aquatic Life Use is reported to be caused by internal nutrient recycling. The Fish Consumption and Primary Contact uses were not assessed.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Great Pond (MA96115) is not proposed to change.

Land use in the Great Pond (MA96115) groundwatershed is primarily residential and open land. MassDOT-owned property within the groundwatershed includes Route 6, located east of Great Pond.

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Great Pond is an inland lake impaired for dissolved oxygen, Chlorophyll-a and total phosphorus, which are typically related to eutrophication processes caused by excess phosphorous.[6] In addition, the *Cape Cod Coastal Drainage Areas, 2004 – 2008 Surface Water Quality Assessment Report* lists Great Pond as impaired for phosphorus. Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Great Pond as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Great Pond. Route 6 is located approximately 0.5 miles north-east of Great Pond (Figure 1). Runoff from a portion of Route 6 at the southern boundary of the groundwatershed is collected with a catch basin network which discharges directly to Minister Pond, which is not impaired. Runoff from the remaining portion of Route 6 is collected with catch basins discharging to depressed areas near the roadway and infiltrates into the ground. According to field observations, no stormwater runoff from Route 6 within the groundwatershed boundaries discharges directly to Great Pond.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Great Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

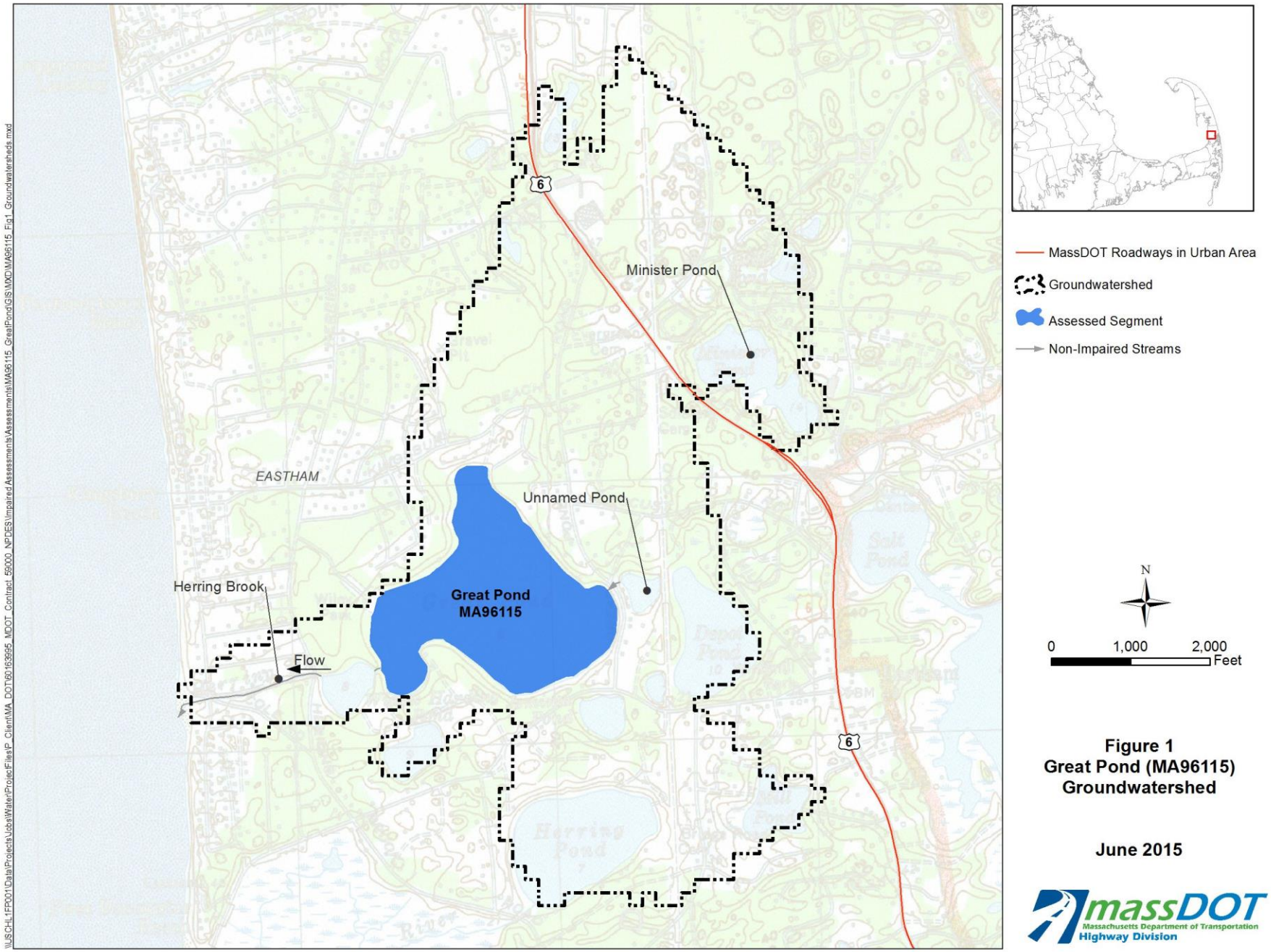

Figure 1
Great Pond (MA96115)
Groundwatershed

June 2015

MassDOT Massachusetts Department of Transportation Highway Division

06/08/2015

Impaired Waters Assessment for Long Pond (MA96183)

Summary

Impaired Water[1]	Stormwater Impairments:	*Low Dissolved Oxygen*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Cape Cod Coastal Drainage Areas 2004-2008 Water Quality Assessment Report* [2]	
Location	Towns:	*Brewster/Harwich*	
	MassDOT Roads:	*Route 6*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Long Pond (MA96183) is a water body approximately 715 acres in size located in Brewster and Harwich, Massachusetts (Figure 1). Long Pond receives flow from Greenland Pond, Smalls Pond and Black Pond. The outflow from Long Pond on the west side of the Pond flows to Hinckley Pond through Herring River (MA96-33).

Long Pond (MA96183) is located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod and adjacent Southeastern Massachusetts Communities are based on groundwater delineations and not ground surface topography. [3] The groundwatersheds for Cape Cod and adjacent Southeastern Massachusetts Communities were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4] Figure 1 illustrates the groundwatershed for Long Pond (MA96183).

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, May 2011. Cape Cod Coastal Drainage Areas 2004-2008 Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/96wqar12.pdf

[3] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Travel times to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857.

[4] USGS. (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

MassDEP's *Cape Cod Coastal Drainage Areas 2004-2008 Water Quality Assessment Report* [2] for Long Pond identified the Aquatic Life as "impaired" due to low dissolved oxygen level. Fish Consumption, and Primary Contact Recreational Use were "not assessed", and Secondary Contact Recreational Use and Aesthetics were identified as "support".

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Long Pond (MA96183) is not proposed to change.

Land use in the Long Pond (MA96183) groundwatershed is primarily forest and residential. MassDOT-owned property within the groundwatershed includes Route 6, located south of Long Pond.

Although MassDOT roadways are within the groundwatershed of this waterbody, stormwater discharges from the roadways do not directly discharge to the water body and are therefore not considered to contribute to the waterbody impairment. Long Pond is an inland lake that is impaired for low dissolved oxygen, which is typically related to eutrophication processes caused by excess phosphorous.[6] In addition, the water quality assessment report identifies excess phosphorous as the source of the nutrient –related impairments. Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater.[7] Therefore, MassDOT has only considered direct surface runoff to Long Pond as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Long Pond. The closest MassDOT-owned urban property is Route 6, located approximately 0.15 miles south of Long Pond (Figure 1). According to field observations, stormwater outfalls along Route 6 in this area appear to discharge within the groundwatershed of Long Pond, but do not discharge directly to the Pond. Runoff from this section of road is collected with catch basins which discharge immediately next to the road where it infiltrates into the ground.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Long Pond, further assessment of this water body is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

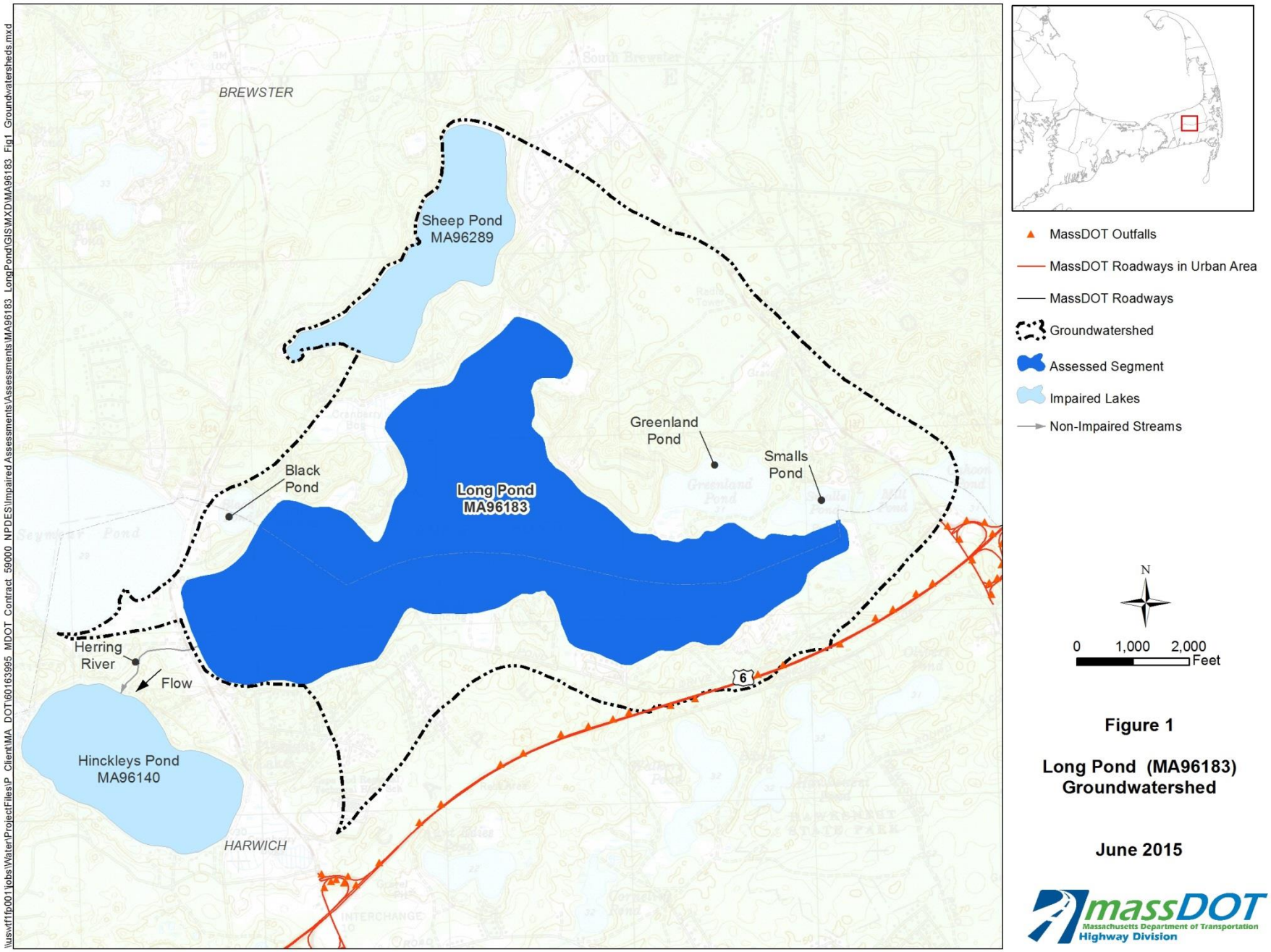

Figure 1

Long Pond (MA96183) Groundwatershed

June 2015

massDOT
Massachusetts Department of Transportation
Highway Division

06/08/2015

Impaired Waters Assessment for Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288)

Summary

Impaired Water[1]	Stormwater Impairments:	*Nutrient/Eutrophication, Biological Indicators*	
	Category:	*5 (Waters requiring a TMDL)*	
	Final TMDLs:	*None*	
	WQ Assessment:	*Cape Cod Coastal Drainage Areas 2004-2008 Surface Water Quality Assessment Report*[2]	
Location	Towns:	*Sandwich*	
	MassDOT Roads:	*Route 6 and Route 130*	
Assessment Method(s)	7R (TMDL Method) ☐	7U (Non-TMDL Method) ☒	No Discharge ☒

Site Description

Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288) are 20 and 24-acre water bodies, respectively, located in the Town of Sandwich between Route 6 to the south and Route 130 to the north. Upper Shawme Lake (MA96326) is located south of and flows north into Shawme Lake Lower (MA96288). The outlet of Shawme Lake Lower (MA96288) is the headwaters of the impaired Mill Creek (MA96-85). Figure 1 illustrates the groundwatershed for Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288). The water bodies share the same groundwatershed. Dams are located north of each lake, as shown on Figures 1a and 1b.

Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288) are located within a USGS-delineated groundwatershed rather than in a surface watershed. The watersheds for Cape Cod are based on groundwater delineations and not ground surface topography.[3] The groundwatersheds for Cape Cod were provided by USGS based on groundwater modeling developed under the Massachusetts Estuary Program (MEP) and contributing groundwater areas as delineated and published in the USGS 451 groundwater contributing areas data.[3,4]

[1] MassDEP, March 2013. Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

[2] MassDEP, May 2011. Cape Cod Coastal Drainage Areas 2004-2008 Surface Water Quality Assessment Report. Available at: http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/96wqar12.pdf

[3] U.S. Geological Survey (USGS). (2009). Groundwater contributing areas for Cape Cod and Plymouth-Carver Regions of Massachusetts. Data Series 451 (1 of 3).

[4] Walter, D.A., Masterson, J.P., and Hess, K.M., 2004, Ground-Water Recharge Areas and Traveltimes to Pumped Wells, Ponds, Streams, and Coastal Water Bodies, Cape Cod, Massachusetts, Scientific Investigations Map I-2857, 1 sheet. Available at: http://pubs.water.usgs.gov/sim20042857

The *Cape Cod Coastal Drainage Areas 2004-2008 Surface Water Quality Assessment Report* [2] lists all uses for Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288) as "not assessed" as no data were available. However, the report mentions Shawme Lake Lower as being listed as a Category 5 on the 2010 Integrated List of Waters due to nutrient/eutrophication biological indicators.

This assessment has been completed based on the *Massachusetts Year 2012 Integrated List of Waters – Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*.[1] MassDEP has released a proposed *Massachusetts Year 2014 Integrated List of Waters,* which has been reviewed for any proposed changes to the condition of the water bodies.[5] The condition of Shawme Lakes (MA96326) and (MA96288) is not proposed to change.

Land use in the Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288) groundwatershed is predominantly forest and open land. The closest MassDOT owned roadway is Route 130, and is approximately 330 feet away from the northern extent of Shawme Lake Lower (MA96288). Route 6 is also a roadway within the mapped urban and area within the watershed. Route 6 is located approximately 0.3 miles south of Upper Shawme Lake (MA96326) (Figure 1a).

Although MassDOT roadways are within the groundwatershed of these waterbodies, stormwater discharges from the roadways do not directly discharge to the water bodies and are therefore not considered to contribute to the waterbodies impairment. Upper Shawme Lake and Shawme Lake Lower are inland lakes impaired for nutrients, and eutrophication / biological indicators. In inland waters, these impairments are typically related to eutrophication processes caused by excess phosphorous.[6] Phosphorus is removed from surface runoff through infiltration, filtration and sorption processes through the natural soil before reaching groundwater[7]. Therefore, MassDOT has only considered direct surface runoff to Shawme Lakes as a contributing cause of the impairment.

After review of aerials and field observations, it was determined that MassDOT property does not directly discharge to Shawme Lakes. The closest MassDOT-owned property within the mapped urban area is Route 130, located approximately 0.3 miles south of Upper Shawme Lake (MA96326) and downstream of the outlet of Shawme Lake Lower (Figure 1b), based on surface water flow patterns. According to field observations, stormwater outfalls along Route 130 in this area appear to discharge to Mill Creek, downstream of Shawme Lakes.

Route 6 is a two lane divided highway traversing the groundwatershed in a north-east direction. Runoff from Route 6 is collected with localized catch basins and discharges to depressed areas along the road, where it infiltrates into the ground.

As defined in MassDOT's assessment methodology,[8] since this portion of MassDOT's urban property does not directly contribute stormwater runoff to Shawme Lakes, further assessment of these water bodies is not warranted under the Impaired Waters Program. MassDOT will continue to implement the measures outlined in its Stormwater Management Plan (SWMP) statewide to minimize the impacts of stormwater from its property.

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[5] MassDEP, June 2014. Massachusetts Year 2014 Integrated List of Waters – Proposed Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act. Massachusetts. Available at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14iwlistp.pdf

[6] CWP, 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1. Ellicot, Md.

[7] NCHRP, 2006. Report 565: Evaluation of Best Management Practices for Highway Runoff Control. Transportation Research Board of the National Academies.

[8] MassDOT, April 2010. BMP 7U: Water Quality Impaired Waters Assessment and Mitigation Plan. Available at: http://www.massdot.state.ma.us/Portals/8/docs/environmental/npdes/BMP_7U_ImpairedWaterbodiesAssessment.pdf

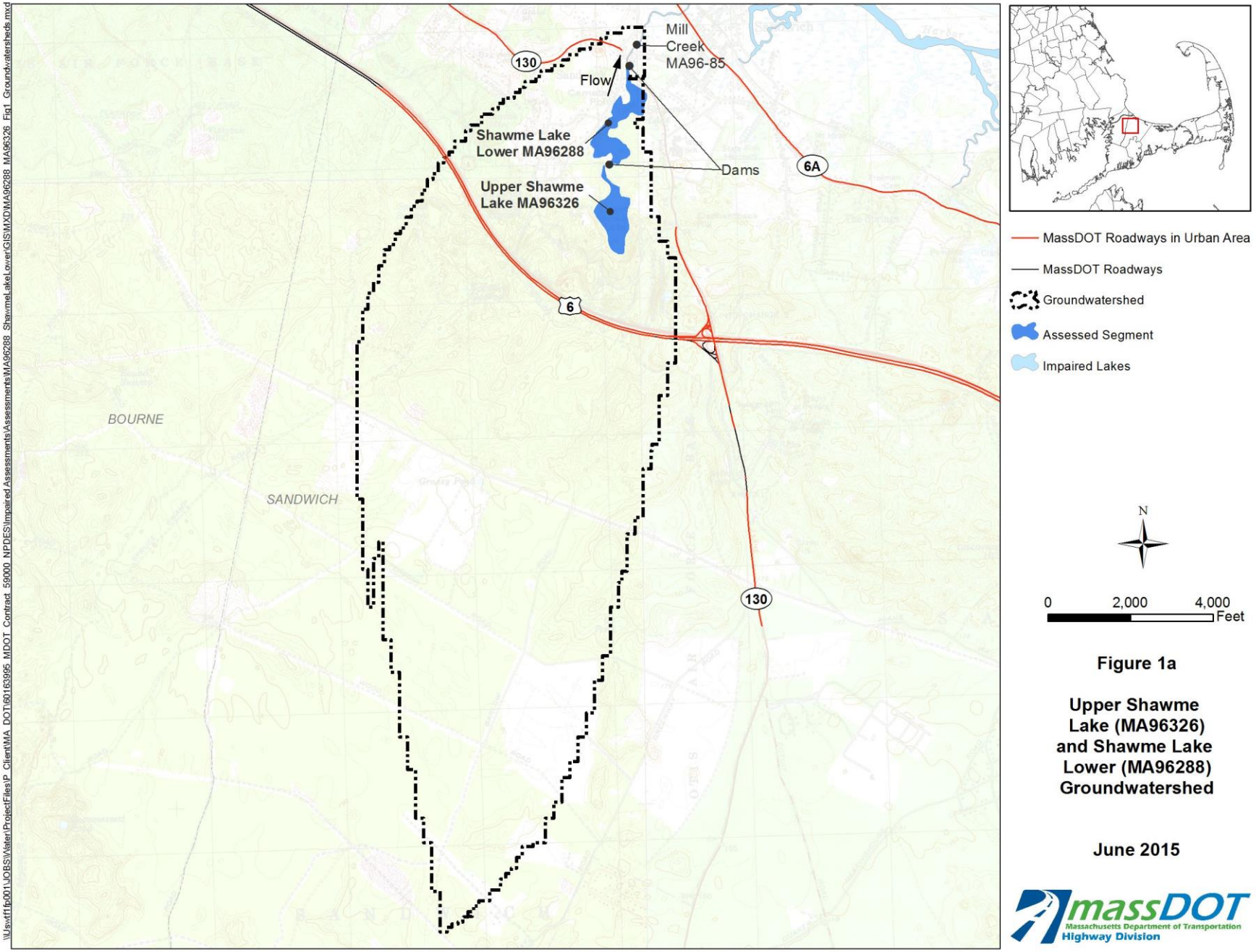
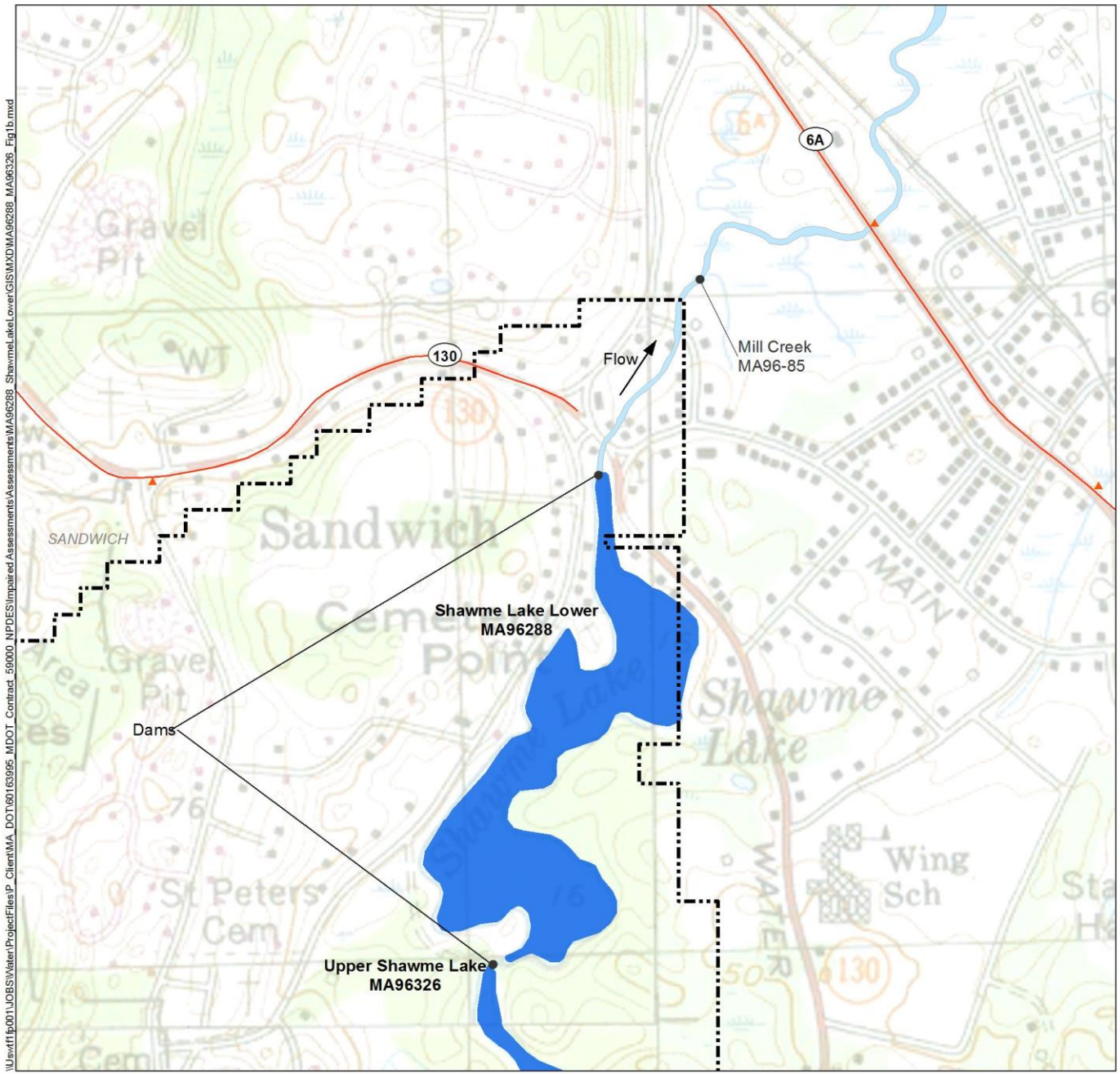
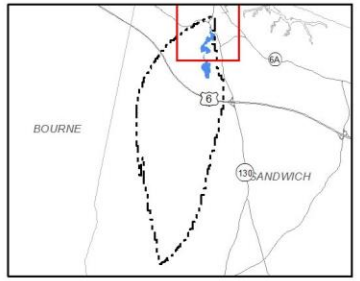


Figure 1a

Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288) Groundwatershed

June 2015





- MassDOT Outfalls
- MassDOT Roadways in Urban Area
- Groundwatershed
- Assessed Segment
- Impaired Lakes

N

0 500 1,000 Feet

Figure 1b

Upper Shawme Lake (MA96326) and Shawme Lake Lower (MA96288) Groundwatershed

June 2015

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