Establishing Nitrogen Target Concentrations for Three Long Island Sound Watershed Groupings:

Embayments, Large Riverine Systems, and Western Long Island Sound Open Water

Subtask B. Regulated Point Source Discharges

Submitted to:

U.S. Environmental Protection Agency
Region 1 and Long Island Sound Office

Submitted by:

Tetra Tech, Inc.

October 1, 2020

This Tetra Tech technical study was commissioned by the United States Environmental Protection Agency (EPA) to synthesize and analyze water quality data to assess nitrogen-related water quality conditions in Long Island Sound and its embayments, based on the best scientific information reasonably available. This study is neither a proposed Total Maximum Daily Load (TMDL), nor proposed water quality criteria, nor recommended criteria. The study is not a regulation, is not guidance, and cannot impose legally binding requirements on EPA, States, Tribes, or the regulated community. The technical study might not apply to a particular situation or circumstance, but it is intended as a source of relevant information to be used by water quality managers, at their discretion, in developing nitrogen reduction strategies.

Subtask B. Regulated Point Source Discharges

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Introduction and Methods Overview

The purpose of this Subtask was to estimate nitrogen contributions to Long Island Sound (LIS) from regulated point source discharges, including wastewater plant discharges, major industrial point source discharges, and municipal separate storm sewer system (MS4) stormwater discharges. In addition to this summary information, Tetra Tech has also provided all collected data in an Excel file (*Appendix B: Dischargers Compiled*). These data will be used in setting load reductions and allocation options after nitrogen target concentrations are developed.

Traditional Point Sources

The U.S. Environmental Protection Agency (EPA) provided Tetra Tech with five spreadsheets of nitrogen loads, concentrations, and flows for municipal dischargers in Connecticut, Massachusetts, New Hampshire, New York, and Vermont. Tetra Tech performed the following steps to process and summarize the data:

1. Created a master list of data from EPA and other sources discussed below (see *Appendix B: Dischargers Compiled).*
2. Created a unique name corresponding to each facility for the master list (because the names for some of the facilities were different in each spreadsheet).
3. Converted loads from lbs/day to kg/yr.
4. Populated the National Pollutant Discharge Elimination System identifier (NPDES ID) and coordinates from EPA-provided geographic information system (GIS) data; Mullaney and Schwarz (2013) for Connecticut dischargers; EPA Envirofacts or Enforcement and Compliance History Online (ECHO) searches;[1] [2] and the New York-New Jersey Harbor & Estuary Program.[3] Coordinates were also geocoded from EPA Region 1 Massachusetts National Pollutant Discharge Elimination System (NPDES) permit addresses or other addresses found in NPDES permits.[4] Geographic data were populated because they were not consistently included in EPA's data set. All coordinates were verified and corrected to be within the correct state and general geographic vicinity.

To determine industrial load estimates, Tetra Tech queried the Integrated Compliance Information System (ICIS) for non-publicly owned treatment works (POTWs) with total nitrogen load or concentration monitoring data in Connecticut, Massachusetts, New Hampshire, New York, and Vermont and all facilities in Rhode Island. Tetra Tech mapped facilities in GIS and selected those within the LIS watershed (is comprised of multiple subwatersheds, including the Eastern Narrows, Western Narrows, and Connecticut, Housatonic, and Thames rivers) for further analysis. Additionally, Tetra Tech summarized nitrogen loads, concentrations, and flows on an annual basis for the period 2006–2015 (as data were available). For those facilities for which two of three components (load, concentration, and flow) were available, Tetra Tech calculated the third component (e.g., load = concentration * flow).

EPA provided spreadsheets for some facilities that were found to be industrial sources; conversely, some non-POTWs queried in ICIS were found to be municipal or already captured in the EPA-provided data. Therefore, some duplication existed between the EPA-provided data and the ICIS-queried data. Tetra Tech selected the EPA-provided data for each facility, if available, and summarized the ICIS data if

[1] https://www3.epa.gov/enviro/facts/multisystem.html.
[2] https://echo.epa.gov/.
[3] https://fusiontables.google.com/DataSource?docid=10LNWV5NtgO40QSCjjtIj_mzpQ0LzUCHKJ_YSWLkw#rows:id=1.
[4] https://www3.epa.gov/region1/npdes/permits_listing_ma.html.

EPA data were not available. Data for facilities with ICIS-reported loads less than 100 kg N/yr or with no load reported in the past 3 years were not summarized in the final table of point source dischargers, as the facilities were not considered current major industrial point sources. Data from the most recent year for each facility are summarized in Table B-1 and Table B-2.

Tetra Tech also summarized annual nitrogen loads from facilities in Connecticut from a U.S. Geological Survey report (Mullaney and Schwarz 2013). This report contained annual nitrogen loads from 1999 to 2009 for 82 Connecticut wastewater treatment facilities (WWTFs). Tetra Tech standardized units for all loads to kg/yr, concentrations to mg/L, and flows to millions of gallons per day (MGD). No further processing was performed. See *Appendix B: Dischargers Compiled* for results. These results are included as background in the master list, but are not summarized further in this memo because data were available for only one state (Connecticut) and only as recently as 2009.

Municipal Separate Storm Sewer Systems

EPA provided contacts from whom Tetra Tech could request existing MS4 nitrogen loading estimates. Only New York provided existing MS4 nitrogen load estimates. State contacts did not identify existing MS4 nitrogen load estimates for Connecticut, Massachusetts, or Rhode Island. Tetra Tech did not identify any MS4s within the LIS watershed in New Hampshire or Vermont. This section describes the methods used or proposed to provide MS4 load estimates for each state with identified MS4s.

New York MS4s

New York State Department of Environmental Conservation (NYSDEC) provided a June 2015 report titled *Determination of Regulated and Non-regulated Stormwater Loads to LIS from New York State* prepared under contract with the Long Island Sound Study (NYSDEC 2015). The purpose of the project was to assess the stormwater loads from the New York state portion of the LIS watershed, including quantifying the regulated stormwater load from the watershed load. NYSDEC established a methodology for determining the subwatershed loads, the load from the municipal boundaries, and the load from the actual MS4 systems. NYSDEC also completed estimates of the stormwater load from the subwatershed, the municipal boundaries, and the MS4 systems for Port Jefferson Village and New York City. NYSDEC was not able to quantify the MS4 loads from all systems because of a lack of available data. Specifically, there were no electronic data available for MS4 stormwater sewersheds and, for Nassau and Suffolk counties, where stormwater infiltration is a significant management practice within the MS4 system, there were not sufficient data to quantify the locations of these infiltration management practices within the MS4 system to be able to remove that load from the surface water load. To estimate nitrogen loads, NYSDEC used the Watershed Treatment Model (WTM), a spreadsheet-based model that can be used to calculate annual pollutant loads using land use, precipitation, soils, impervious surfaces, and pollutant coefficients. These estimates are based on municipal boundaries, not on sewersheds (except for New York City and Port Jefferson, New York, where these data were available). Therefore, NYSDEC believes estimates generated using the WTM are likely on the high end. For instance, comparing rates for Port Jefferson, New York, where both were available, about 21 percent of the estimated municipal boundary load was attributable to the sewershed load. NYSDEC also provided spatial coverage of regulated MS4s within the LIS watershed.

Massachusetts MS4s

Because Massachusetts did not identify existing MS4 nitrogen loading rates, Tetra Tech estimated MS4 loads using an approach similar to NYSDEC's approach. Tetra Tech estimated MS4 loading rates based on land use categories using Opti-Tool, which is a regional Excel-based stormwater and nutrient best

management practice optimization tool developed by Tetra Tech and EPA Region 1.[5] Opti-Tool has land use-specific nitrogen loading rates developed on the basis of the Storm Water Management Model (SWMM) and calibrated with local precipitation data from Logan Airport in Boston. This approach required the following spatial data sets:

- Land use
- Impervious surface
- Hydrologic soil groups (soil permeability)
- MS4 boundaries

In Massachusetts, the following data sets were used to derive categories consistent with Opti-Tool regional loading rates:

- MassGIS 2005 Land Use polygon shapefile (0.5 m resolution) (accessed on 1/13/2017)
- MassGIS 2005 Impervious Surface Raster (1 m resolution) (accessed on 1/13/2017)
- NRCS SSURGO-Certified Soils polygon shapefile (accessed on 1/13/2017)
- MassGIS 2016 Town Boundaries (accessed on 1/13/2017)
- 2000 and 2010 Urbanized Areas data (provided by Newton Tedder (EPA Region 1) on 1/13/2017 [UA2010_UA2000_merge.shp])

Tetra Tech processed and combined these data to be representative of the Opti-Tool loading rate categories and then clipped the estimates to Massachusetts MS4 boundaries. Areas were estimated for each loading rate category, multiplied by the appropriate areal loading rate, and summed to generate an estimated total nitrogen load for each MS4 in Massachusetts.

Connecticut MS4s

While Connecticut did not identify existing MS4 nitrogen loads, Connecticut Department of Energy and Environmental Protection (CT DEEP) is beginning to develop such load estimates using either nitrogen concentration data collected for each town or the WinSLAMM model. CT DEEP has collected stormwater monitoring data and provided these data to Tetra Tech; however, CT DEEP has not settled on an approach to develop load estimates. Based on EPA's direction, Tetra Tech did not pursue further load estimations for Connecticut at this stage. If EPA requests an alternative approach to CT DEEP's efforts, Tetra Tech proposes applying Opti-Tool regional nitrogen loads in a manner similar to that used for Massachusetts. The proposed method for Connecticut would differ from the Massachusetts approach because Connecticut has neither as finely resolved land use data nor as readily available large-scale parcel data as Massachusetts. Tetra Tech proposes to use National Land Cover Database (NLCD) 2011 land use data (30 meter resolution) and percent impervious data,[6] soils included in the Soil Survey Geographic (SSURGO) Database,[7] and buffered roads data (no source identified) as the input files similar to those for Massachusetts. The Opti-Tool regional loading rates are distinct for residential (14.1 lb/ac/yr) and commercial (15.08 lb/ac/yr) development. Because the loading rates are similar and no statewide parcel data are available for Connecticut to readily differentiate these development categories, however, Tetra Tech proposes that one average loading rate be applied to both residential and commercial developed areas.

[5] https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=289305.
[6] https://www.mrlc.gov/nlcd2011.php.
[7] https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

Rhode Island MS4s

A small portion of the Pawcatuck River embayment extends into Rhode Island where there is existing MS4 data. Therefore, Tetra Tech proposes applying the same approach used for Connecticut to Rhode Island, using either the WinSLAMM model or, alternatively, applying the Opti-Tool regionally using NLCD 2011 land use data and data from the SSURGO Database. Based on EPA's direction, Tetra Tech did not pursue load estimations for Rhode Island at this stage.

Results

Table B-1 summarizes, by state, the number of point and MS4 sources, their total estimated loads, and their percent contributions to the overall total. Tetra Tech identified 235 municipal and industrial point source dischargers with estimated nitrogen loads within the LIS watershed. The majority of these are municipal dischargers (211), with 19 industrial dischargers, and 5 government facilities that include a state-operated school (Southbury Training School), and 4 state-operated fish hatcheries. These 235 facilities discharged a combined 19.2 million kg N/yr to the LIS watershed based on the most recent year of available data; with 68 percent of the total load from facilities in New York and 18 percent from facilities in Connecticut.

Tetra Tech identified 340 regulated MS4s within the LIS watershed, including 202 in Connecticut, 86 in New York, 47 in Massachusetts, and 5 in Rhode Island. The combined load from New York and Massachusetts was estimated at over 1.3 million kg N/yr. Figure B-1 and Figure B-2 show all point source dischargers and all MS4s for the entire LIS watershed, respectively. Figure B-3 and Figure B-4 provide close-up views of the same point source dischargers and MS4s.

Table B-1. Point Sources and MS4s in the LIS Watershed

State	# of Facilities	Total Estimated Point Source Load (kg N/yr)	% Total Point Source Load	# of MS4s	Total Estimated MS4 Load (kg N/yr)
CT	91	3,507,385	18	202	*Not estimated*
MA	60	2,037,921	11	47	430,402
NH	26	255,105	1	0	*No MS4s in the NH portion of the LIS watershed*
NY	22	13,025,669	68	86	924,217
RI	2	74,909	0.4	5	*Not estimated*
VT	34	255,437	1	0	*No MS4s in the VT portion of the LIS watershed*
Total	**235**	**19,156,426**		**340**	**N/A**[a]

[a] The total estimated MS4 load for all states is not provided because loads were not estimated for Connecticut or Rhode Island at this time.

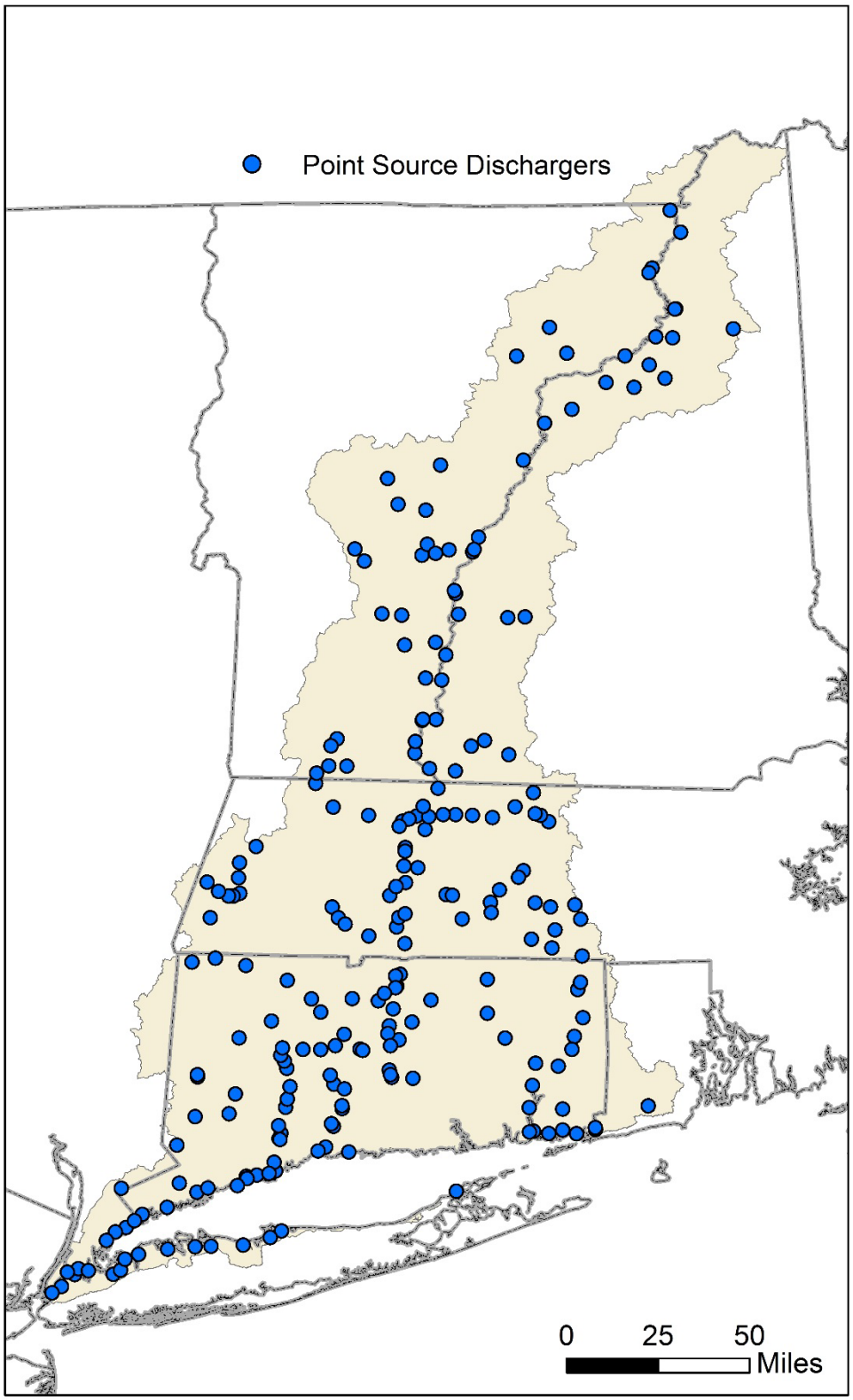

Figure B-1. Point Sources in the LIS Watershed

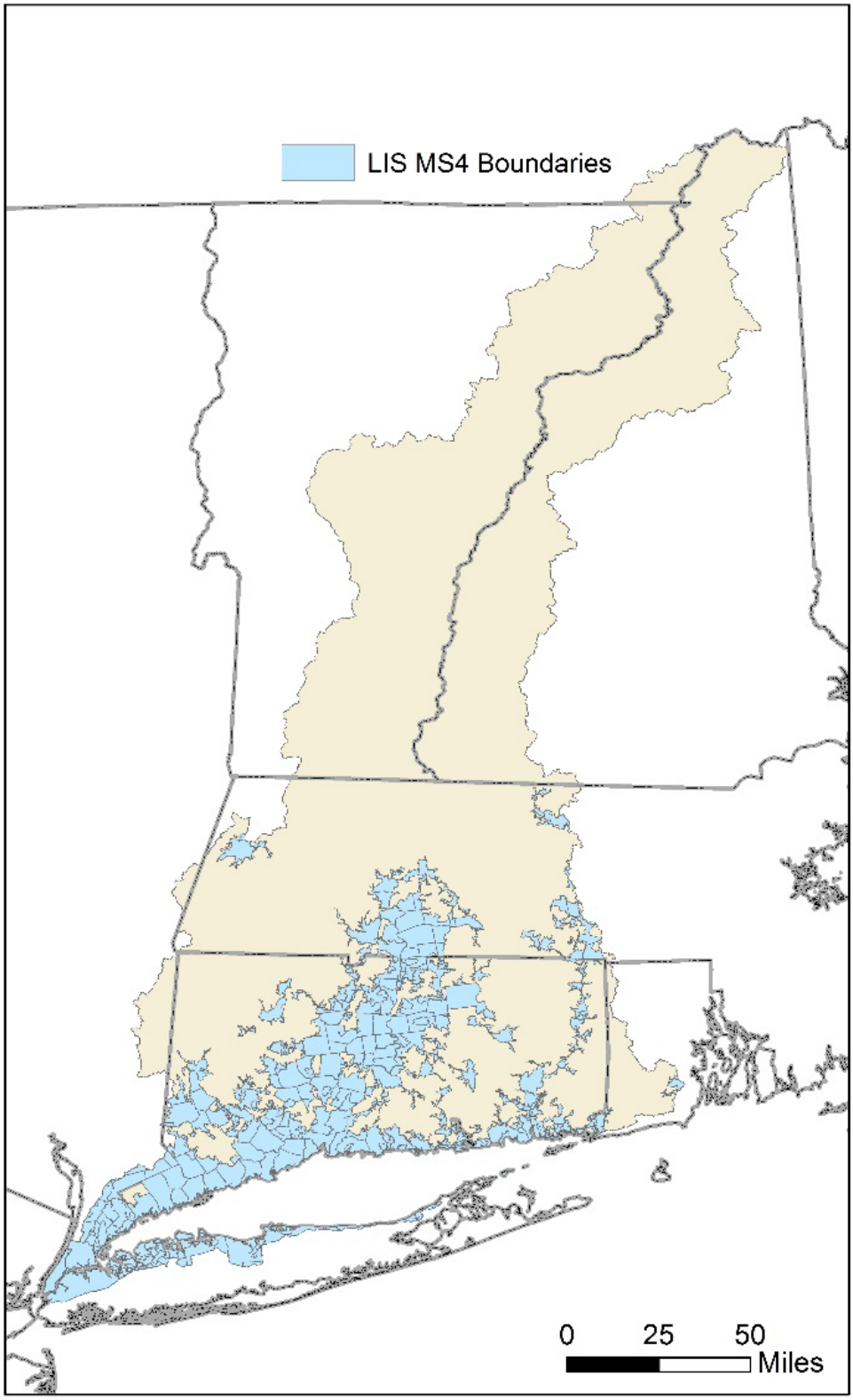

Figure B-2. MS4s in the LIS Watershed

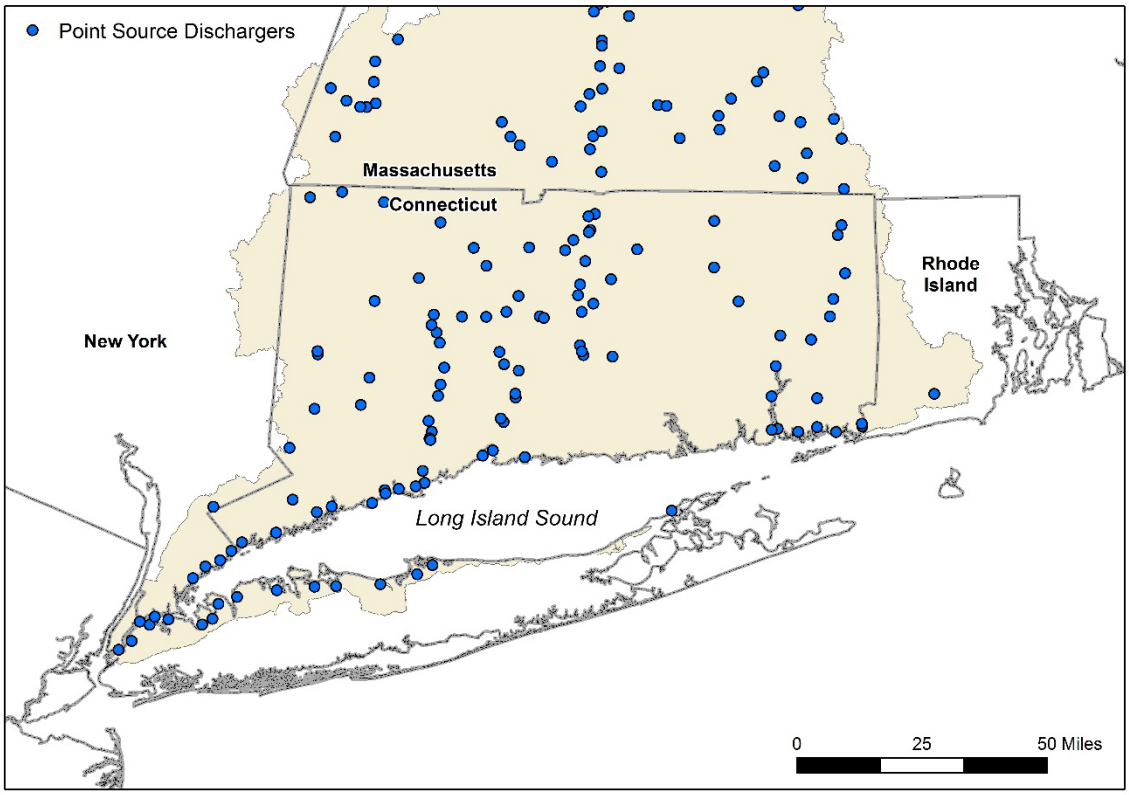

Figure B-3. Close-up of Point Sources in the LIS Watershed

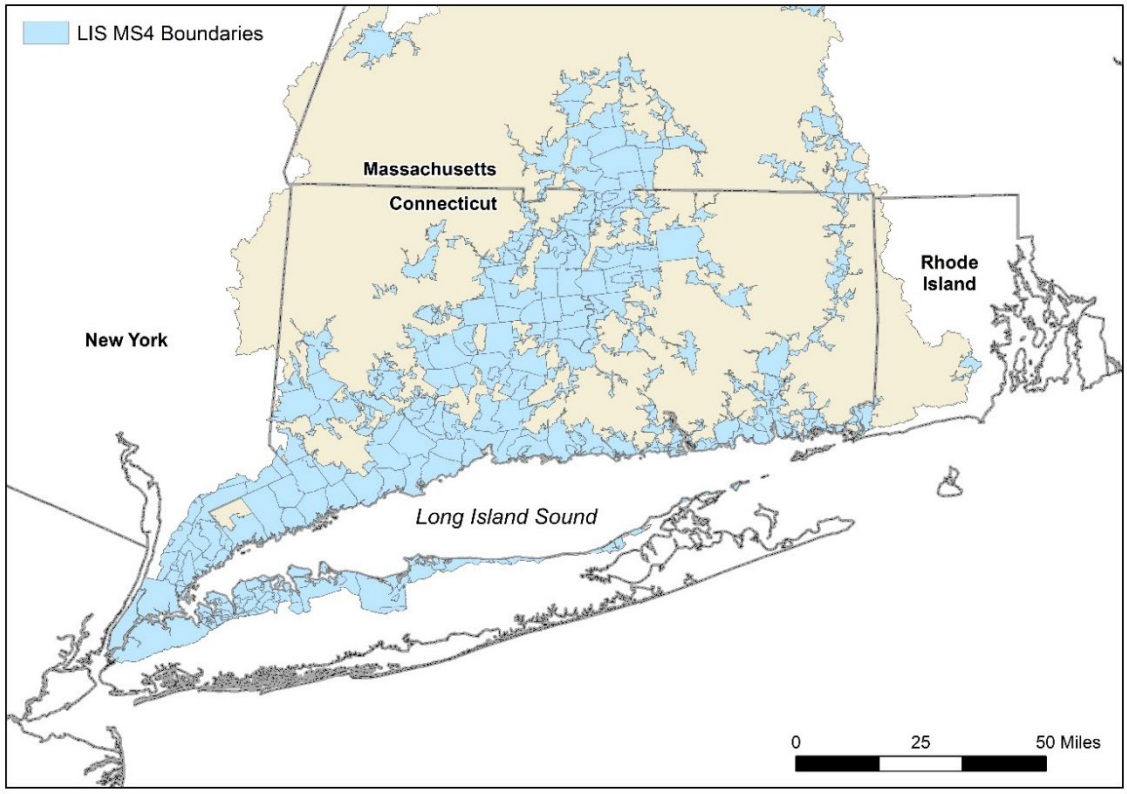

Figure B-4. Close-up of MS4s in the LIS Watershed

Table B-2 provides summary details of all 235 point sources, including the facility name, NPDES ID, name of the watershed in which the point source is located (if applicable), receiving water name, design flow and actual flow from the point source, and total nitrogen load and concentration from the point source. Actual flow, load, and concentration reported in Table B-2 are from the most recent reported year (typically 2015). See *Appendix B: Dischargers Compiled* for the most recent data year as well as compiled annual loads, concentrations, and flows from the period 1994–2015.

Table B-2. Summary of Municipal and Industrial Point Sources in LIS

Facility	NPDES ID	Watershed	Receiving Water	Design Flow (MGD)	Actual Flow (MGD)	Load (kg N/yr)	Concentration (mg/L)
Connecticut							
Aluminum Finishing Company Inc.	CTCIU0004	Black Rock Harbor, CT	Unknown	N/A	0.008	151	14.05
Ansonia WPCF HRW	CT0100013	N/A	Naugatuck River	3.5	1.58	8,615	3.94
Beacon Falls WPCF HRW	CT0101061	N/A	Naugatuck River	0.71	0.287	8,284	20.85
Branford WPCF	CT0100048	Branford Harbor, CT	Branford Harbor	4.9	3.09	15,242	3.56
Bridgeport East WPCF	CT0101010	Bridgeport Harbor, CT	Bridgeport Harbor	10	6.383	59,146	6.69
Bridgeport West WPCF	CT0100056	Black Rock Harbor, CT	Long Island Sound, Cedar Creek	40	21.9	170,479	5.62
Bristol WPCF CRW	CT0100374	N/A	Pequabuck River	10.5	5.88	70,743	8.69
Canton WPCF CRW	CT0100072	N/A	Farmington River	0.95	0.519	9,775	13.61
Cheshire WPCF	CT0100081	New Haven Harbor, CT	Quinnipiac River	3.5	2.23	9,940	3.22
Cytec (Industrial) (P)	CT0000086	New Haven Harbor, CT	Quinnipiac River	N/A	N/A	34,460	N/A
Danbury WPCF HRW	CT0100145	N/A	Seth Williams Brook	15.5	8.34	56,164	4.86
Derby WPCF HRW	CT0100161	N/A	Housatonic River	3.5	1.2	11,266	6.78
East Hampton WPCF CRW	CT0024694	N/A	Connecticut River	3.8	1.21	13,254	7.91
East Hartford WPCF CRW	CT0100170	N/A	Connecticut River	12.5	5.52	51,193	6.70
East Windsor WPCF CRW	CT0100196	N/A	Connecticut River	2.5	0.765	4,639	4.38
Electric Boat Corporation TRW	CT0003824	Thames River, CT	Thames River	N/A	0.254	2,900	10.81
Enfield WPCF CRW	CT0100200	N/A	Connecticut River	10	5.03	39,431	5.66
Fairfield WPCF	CT0101044	Pine Creek, CT	Long Island Sound	9	7.412	49,040	4.78
Farmington WPCF CRW	CT0100218	N/A	Farmington River	5.56	3.39	61,797	13.17
Glastonbury WPCF CRW	CT0100226	N/A	Connecticut River	3.64	2.04	8,118	2.87
Greenwich WPCF EN	CT0100234	Greenwich Harbor, CT	Long Island Sound	12	8.09	73,063	6.52
Groton City WPCF	CT0101184	Mumford Cove, CT	Thames River	3.1	1.78	13,254	5.38
Groton Town WPCF	CT0100242	Mumford Cove, CT	Thames River	7.5	2.69	39,762	10.68
Hartford WPCF CRW	CT0100251	N/A	Connecticut River	80	50	722,341	10.44
Jewett City WPCF TRW	CT0100269	N/A	Quinebaug River	0.5	0.33	1,491	3.26
Killingly WPCF TRW	CT0101257	N/A	Quinebaug River	8	2.74	21,372	5.63
Kimberly-Clark Corporation HRW	CT0003212	N/A	Housatonic River	N/A	2.955	7,324	1.79
Ledyard WPCF	CT0101681	Mystic River, CT	Seth Williams Brook	0.26	0.131	663	3.65

Facility	NPDES ID	Watershed	Receiving Water	Design Flow (MGD)	Actual Flow (MGD)	Load (kg N/yr)	Concentration (mg/L)
Litchfield WPCF HRW	CT0100803	N/A	Bantam River	0.8	0.423	2,651	4.53
Manchester WPCF CRW	CT0100293	N/A	Hockanum River	8.25	5.33	48,543	6.58
Marsam Metal Finishing CRW	CTCIU0001	N/A	Unnamed Stream	N/A	0.005	182	27.23
Mattabasset WPCF CRW	CT0100307	N/A	Connecticut River	20	16.1	136,185	6.11
Meriden WPCF	CT0100315	New Haven Harbor, CT	Quinnipiac River	11.6	8.84	19,218	1.57
Middletown WPCF CRW	CT0100323	N/A	Connecticut River	6.75	3.63	83,003	16.52
Milford Beaver Brook WPCF HRW	CT0100749	Housatonic River, CT	Housatonic River	3.1	1.45	8,449	4.21
Milford Housatonic WPCF HRW	CT0101656	Housatonic River, CT	Housatonic River	8	5.76	43,407	5.44
Montville WPCF TRW	CT0100935	Thames River, CT	Thames River	7.2	1.408	9,112	4.68
Naugatuck WPCF HRW	CT0100641	N/A	Naugatuck River	10.3	5.341	30,153	4.08
New Canaan WPCF EN	CT0101273	Five Mile River, CT	Five Mile River	1.7	0.881	2,816	2.31
New Hartford CRW	CT0100331	N/A	Farmington River	0.4	N/A	166	N/A
New Haven East WPCF	CT0100366	New Haven Harbor, CT	New Haven Harbor	40	23.45	527,342	16.25
New London WPCF TRW	CT0100382	Thames River, CT	Thames River	10	5.66	46,389	5.92
New Milford WPCF HRW	CT0100391	N/A	Housatonic River	1.02	0.56	3,976	5.13
Newtown WPCF HRW	CT0101788	N/A	Pootactuck River	0.932	0.466	2,485	3.85
Norfolk WPCF HRW	CT0101231	N/A	Blackberry River	0.35	0.306	1,988	4.69
North Canaan WPCF HRW	CT0100064	N/A	Blackberry River	0.4	0.28	4,473	11.54
North Haven WPCF	CT0100404	New Haven Harbor, CT	Quinnipiac River	4.5	2.79	22,863	5.92
Norwalk WPCF	CT0101249	Norwalk Harbor, CT	Norwalk River	18	12.525	96,588	5.57
Norwich WPCF TRW	CT0100412	Thames River, CT	Thames River	8.5	3.32	74,885	16.29
Pape Electroplating Co. CRW	CTCIU0013	N/A	Unnamed Stream	N/A	0.029	1,027	25.31
Pharmacia & Upjohn Company, LLC	CT0001341	New Haven Harbor, CT	Quinnipiac River	N/A	0.132	1,070	5.87
Plainfield North WPCF TRW	CT0100447	N/A	Moosup River	1.08	0.587	10,438	12.84
Plainfield Village WPCF TRW	CT0100439	N/A	Mill Brook	0.7	0.35	9,278	19.15
Plainville WPCF CRW	CT0100455	N/A	Pequabuck River	3.8	1.958	13,585	5.01
Plymouth WPCF CRW	CT0100463	N/A	Pequabuck River	1.75	0.696	9,443	9.80
Portland WPCF CRW	CT0101150	N/A	Connecticut River	1.2	0.399	3,811	6.90
Putnam WPCF TRW	CT0100960	N/A	Quinebaug River	2.91	1.051	7,124	4.90
Ridgefield South St. WPCF	CT0100854	N/A	Great Swamp	1	0.726	7,124	7.09
Rocky Hill WPCF CRW	CT0100480	N/A	Connecticut River	7.5	3.058	75,713	17.89
Salisbury WPCF HRW	CT0100498	N/A	Factory Brook	0.67	0.304	3,645	8.66
Seidel Incorporated HRW	CTCIU0016	N/A	Naugatuck River	N/A	0.027	282	7.81
Seymour WPCF HRW	CT0100501	N/A	Naugatuck River	2.93	1.071	8,781	5.92
Shelton WPCF HRW	CT0100714	N/A	Housatonic River	4	2.083	14,414	5.00
Simsbury WPCF CRW	CT0100919	N/A	Farmington River	3.8	1.883	6,130	2.35
South Windsor WPCF CRW	CT0100510	N/A	Connecticut River	3.75	2.317	17,230	5.37

Facility	NPDES ID	Watershed	Receiving Water	Design Flow (MGD)	Actual Flow (MGD)	Load (kg N/yr)	Concentration (mg/L)
Southbury Tr. School WPCF HRW	CT0100528	N/A	Transylvania Brook	N/A	N/A	497	N/A
Southington WPCF	CT0100536	New Haven Harbor, CT	Quinnipiac River	7.4	5.003	13,751	1.99
Sprague WPCF TRW	CT0100978	N/A	Shetucket River	0.4	0.116	1,491	9.29
Stafford Springs WPCF TRW	CT0101214	N/A	Willimantic River	2	0.784	12,260	11.30
Stamford WPCF EN	CT0101087	Stamford Harbor, CT	Stamford Harbor	24	15.416	46,058	2.16
Stonington Borough WPCF	CT0101281	Stonington Harbor, CT	Stonington Harbor	0.66	0.103	663	4.65
Stonington Mystic WPCF	CT0100544	Mystic River, CT	Mystic River	0.8	0.477	2,485	3.76
Stonington/Pawcatuck WPCF	CT0101290	Pawcatuck River, RI and CT	Pawcatuck River	1.3	0.48	1,822	2.74
Stratford WPCF HRW	CT0101036	Housatonic River, CT	Housatonic River	14	6.675	40,590	4.39
Suffield WPCF CRW	CT0100552	N/A	Connecticut River	20.2	1.211	3,645	2.17
Summit Corporation of America HRW	CT0001180	N/A	Naugatuck River	N/A	0.085	1,154	9.84
The Bass Plating Company CRW	CTCIU0011	N/A	Mill Brook	N/A	0.013	606	32.64
Thomaston WPCF HRW	CT0100781	N/A	Naugatuck River	1.38	0.833	3,479	3.02
Thompson WPCF TRW	CT0100706	N/A	Quinebaug River	1.35	0.29	5,964	14.86
Torrington WPCF HRW	CT0100579	N/A	Naugatuck River	7	4.952	45,395	6.62
UCONN WPCF TRW	CT0101320	N/A	Willimantic River	3	0.17	9,443	40.13
UniMetal Surface Finishing, LLC HRW	CT0025305	N/A	Naugatuck River	N/A	0.071	6,231	63.91
Vernon WPCF CRW	CT0100609	N/A	Hockanum River	7.1	2.869	65,441	16.48
Wallingford WPCF	CT0100617	New Haven Harbor, CT	Quinnipiac River	8	4.95	76,707	11.19
Waterbury WPCF HRW	CT0100625	N/A	Naugatuck River	27.05	16.477	94,600	4.15
West Haven WPCF	CT0101079	New Haven Harbor, CT	New Haven Harbor	12.5	5.358	34,957	4.71
Westport WPCF	CT0100684	Saugatuck River, CT	Saugatuck River	3.25	1.351	3,313	1.77
Windham WPCF TRW	CT0101001	N/A	Shetucket River	5.5	1.674	15,242	6.58
Windsor Locks WPCF CRW	CT0101591	N/A	Connecticut River	2.12	1.158	8,449	5.27
Windsor Poquonock WPCF CRW	CT0100994	N/A	Farmington River	5	1.917	83,334	31.40
Winsted WPCF CRW	CT0101222	N/A	Still River	3.5	1.258	11,929	6.85
Massachusetts							
Amherst CRW	MA0100218	N/A	Connecticut River	7.1	3.959	72,098	13.18
Athol CRW	MA0100005	N/A	Millers River	1.75	0.926	20,779	16.24
Australis Aquaculture, LLC CRW	MA0110264	N/A	Connecticut River	N/A	0.112	22,880	147.61
Barre CRW	MA0103152	N/A	Ware River	0.3	0.202	12,579	45.07
Belchertown CRW	MA0102148	N/A	Lampson Brook to Connecticut River	1	0.37	5,787	11.32
C.L. Mclaughlin State Trout Hatchery/Belchertown CRW	MA0110043	N/A	Swift River	N/A	5.121	7,252	1.03

Facility	NPDES ID	Watershed	Receiving Water	Design Flow (MGD)	Actual Flow (MGD)	Load (kg N/yr)	Concentration (mg/L)
C.L. Mclaughlin State Trout Hatchery/Blitzer CRW	MA0110051	N/A	Unnamed Stream	N/A	1.373	2,054	1.08
Charlemont CRW	MA0103101	N/A	Deerfield River	0.05	0.015	808	39.00
Charlton TRW	MA0101141	N/A	Cady Brook	0.45	0.2	3,510	12.70
Chicopee CRW	MA0101508	N/A	Chicopee River, Connecticut River	15.5	8.5	346,468	29.50
Crane HRW	MA0000671	N/A	Housatonic River	4.7	3.1	35,123	8.20
Easthampton CRW	MA0101478	N/A	Manhan River, Connecticut River	3.8	1.67	33,620	14.57
Erving #1 CRW	MA0101516	N/A	Millers River	1.02	0.133	1,329	7.23
Erving #2 CRW	MA0101052	N/A	Millers River	2.7	1.83	5,790	2.29
Erving #3 CRW	MA0102776	N/A	Millers River	0.01	0.0061	303	36.00
Gardner CRW	MA0100994	N/A	Otter River	5	3.04	70,147	16.70
Great Barrington HRW	MA0101524	N/A	Housatonic River	3.2	2.6	61,072	17.00
Greenfield CRW	MA0101214	N/A	Deerfield River	3.4	3.27	67,277	14.89
Hadley CRW	MA0100099	N/A	Connecticut River	0.54	0.383	13,161	24.87
Hardwick Gilbertville CRW	MA0100102	N/A	Ware River	0.23	0.1249	1,973	11.43
Hardwick Wheelright CRW	MA0102431	N/A	Ware River	0.04	0.0167	738	32.00
Hatfield CRW	MA0101290	N/A	Connecticut River	0.5	0.192	8,312	31.33
Holyoke CRW	MA0101630	N/A	Connecticut River	17.5	7.6	89,260	8.50
Huntington (MA) CRW	MA0101265	N/A	West Branch Westfield River	0.2	0.0618	1,674	19.60
Lee HRW	MA0100153	N/A	Housatonic River	1	0.87	17,430	14.50
Leicester TRW	MA0101796	N/A	French River	0.35	0.29	6,211	15.50
Lenox HRW	MA0100935	N/A	Housatonic River	1.19	0.79	12,880	11.80
Mead Laurel Mill HRW	MA0001716	N/A	Housatonic River	N/A	1.5	13,265	6.40
Mead Willow Mill HRW	MA0001848	N/A	Housatonic River	N/A	1.1	6,992	4.60
Monroe CRW	MA0100188	N/A	Deerfield River	0.02	0.011	387	25.48
Montague CRW	MA0100137	N/A	Connecticut River	1.83	0.856	17,848	15.09
North Brookfield CRW	MA0101061	N/A	Forget-Me-Not Brook	0.76	0.339	12,647	27.00
Northampton CRW	MA0101818	N/A	Connecticut River	8.6	4.1	85,543	15.10
Northfield CRW	MA0100200	N/A	Connecticut River	0.28	0.087	707	5.88
Northfield School CRW	MA0032573	N/A	Connecticut River	0.45	0.08	1,470	13.30
Old Deerfield CRW	MA0101940	N/A	Deerfield River	0.25	0.0695	2,133	22.21
Orange CRW	MA0101257	N/A	Millers River	1.1	0.99	14,773	10.80
Oxford TRW	MA0100170	N/A	French River	0.5	0.23	4,926	15.50
Palmer CRW	MA0101168	N/A	Chicopee River, Quaboag River, Ware River	5.6	1.5	21,244	10.25
Pittsfield HRW	MA0101681	N/A	Housatonic River	17	12	205,601	12.40
Royalston CRW	MA0100161	N/A	Millers River	0.04	0.0187	506	19.60
Russell CRW	MA0100960	N/A	Westfield River	0.24	0.117	3,169	19.60
Seaman Paper Co of Mass Inc CRW	MA0000469	N/A	Otter River	N/A	0.917	13,310	10.51
Shelburne Falls CRW	MA0101044	N/A	Deerfield River	0.25	0.16	3,592	16.25
South Deerfield CRW	MA0101648	N/A	Connecticut River	0.85	0.4	2,360	4.27
South Hadley CRW	MA0100455	N/A	Connecticut River	4.2	2.53	69,216	19.80

Facility	NPDES ID	Watershed	Receiving Water	Design Flow (MGD)	Actual Flow (MGD)	Load (kg N/yr)	Concentration (mg/L)
Southbridge TRW	MA0100901	N/A	Quinebaug River (French and Quinebaug Rivers Watershed)	3.77	2.9	62,109	15.50
Spencer CRW	MA0100919	N/A	Cranberry Brook	1.08	0.82	14,956	13.20
Springfield (MA) CRW	MA0101613	N/A	Mill River, Chicopee River, Connecticut River	67	40	387,989	7.02
Stockbridge HRW	MA0101087	N/A	Housatonic River	0.3	0.24	3,681	11.10
Sturbridge TRW	MA0100421	N/A	Quinebaug River	0.75	0.6	8,622	10.40
Sunderland CRW	MA0101079	N/A	Connecticut River	0.5	0.169	3,428	14.68
Templeton CRW	MA0100340	N/A	Otter River, Millers River	2.8	0.282	1,804	4.63
Ware CRW	MA0100889	N/A	Ware River	1	0.592	10,699	13.08
Warren CRW	MA0101567	N/A	Quaboag River (Chicopee River Basin)	1.5	0.286	7,512	19.01
Webster TRW	MA0100439	N/A	French River	6	3.44	82,705	17.40
West Stockbridge HRW	MA0103110	N/A	Williams River	0.076	0.018	386	15.50
Westfield CRW	MA0101800	N/A	Westfield River	6.1	3.3	46,144	10.12
Winchendon CRW	MA0100862	N/A	Millers River	1.1	0.563	7,600	9.77
Woronoco Village CRW	MA0103233	N/A	Westfield River	0.02	0.003	81	19.60
New Hampshire							
Bethlehem Village District CRW	NH0100501	N/A	Ammonoosuc River	0.34	0.22	4,107	13.51
Charlestown WWTF CRW	NH0100765	N/A	Connecticut River	1.1	0.31	8,644	20.18
Cheshire County Complex CRW	NHG580391	N/A	Connecticut River	N/A	0.015	260	12.34
Claremont WWTF CRW	NH0101257	N/A	Sugar River	3.89	1.54	29,790	14.00
Colebrook WWTF CRW	NH0100315	N/A	Connecticut River	0.45	0.2	4,234	15.32
Groveton WWTF CRW	NH0100226	N/A	Upper Ammonoosuc River	0.37	0.14	2,778	14.36
Hanover WWTF CRW	NH0100099	N/A	Connecticut River	2.3	0.69	28,602	30.00
Hinsdale WWTF CRW	NH0100382	N/A	Ashuelot River	0.3	0.23	4,926	15.50
Keene WWTF CRW	NH0100790	N/A	Ashuelot River	6	3.26	57,206	12.70
Lancaster Grange Facility CRW	NHG581249	N/A	Otter Brook	N/A	0.004	87	17.15
Lancaster POTW CRW	NH0100145	N/A	Connecticut River	1.2	0.89	12,814	10.42
Lebanon WWTF CRW	NH0100366	N/A	Connecticut River, Mascoma River, Great Brook	3.18	1.74	47,122	19.60
Lisbon WWTF CRW	NH0100421	N/A	Ammonoosuc River	0.32	0.14	4,126	21.33
Littleton WWTF CRW	NH0100153	N/A	Ammonoosuc River	1.5	0.76	5,293	5.04
Newport WWTF CRW	NH0100200	N/A	Sugar River	1.3	0.74	20,041	19.60
NH Fish & Game-Berlin Fish Hatchery CRW	NH0000621	N/A	No. 9 Brook, York Pond, Cold Brook and West Branch Upper Ammonoosuc River	N/A	1.824	520	0.21
NH Fish & Game-Twin Mountain Fish Hatchery CRW	NH0000744	N/A	Carroll Stream	N/A	0.731	960	0.95

Facility	NPDES ID	Watershed	Receiving Water	Design Flow (MGD)	Actual Flow (MGD)	Load (kg N/yr)	Concentration (mg/L)
Northumberland Village WPCF CRW	NH0101206	N/A	Connecticut River	0.06	0.03	401	9.67
Stratford Millhouse System CRW	NHG581214	N/A	Connecticut River	N/A	0.006	249	28.73
Stratford Village WWTP CRW	NHG580536	N/A	Connecticut River	N/A	0.011	316	20.47
Sunapee WPCF CRW	NH0100544	N/A	Sugar River	0.64	0.49	10,494	15.50
Swanzey WWTP CRW	NH0101150	N/A	Ashuelot River	0.167	0.07	1,499	15.50
Troy WWTF CRW	NH0101052	N/A	Ashuelot River	0.265	0.07	2,198	22.73
Whitefield WWTF CRW	NH0100510	N/A	Johns River	0.185	0.07	3,675	38.00
Winchester WWTP CRW	NH0100404	N/A	Ashuelot River	0.28	0.17	991	4.22
Woodsville Fire District CRW	NH0100978	N/A	Connecticut River	0.33	0.17	3,772	16.06
New York							
Belgrave WN	NY0026841	Little Neck Bay, NY	Little Neck Bay	2	1.4	14,082	8.50
Blind Brook WPCF EN	NY0026719	Milton Harbor, NY	Blind Brook	5	2.8	33,963	8.60
Bowery Bay WN	NY0026158	East River, NY	East River	150	106	1,888,691	13.00
Glen Cove EN	NY0026620	Hempstead Harbor, NY	Glen Cove Creek	5.5	2.8	25,514	6.60
Great Neck WPCD WN	NY0026999	Manhasset Bay, NY	Manhasset Bay	3.8	2.9	36,614	8.10
Greenport (Village)	NY0020079	N/A	Long Island Sound	0.65	0.6	2,816	3.49
Huntington (NY) EN	NY0021342	Huntington Harbor, NY	Huntington Harbor	2.5	2.2	9,112	3.40
Hunts Point WN	NY0026191	East River, NY	East River	200	124	1,358,532	7.80
Kings Park (SCSD #6)	NY0023311	Nissequogue River, NY	Nissequogue River	0.6	0.3	1,491	3.30
Mamaroneck WPCF EN	NY0026701	Mamaroneck River, NY	Long Island Sound	20.6	13.3	51,359	2.70
New Rochelle WPCF EN	NY0026697	N/A	Mamaroneck Harbor	13.6	12.4	48,046	2.80
Newtown Creek WN	NY0026204	East River, NY	Newtown Creek	310	215	5,483,830	18.80
North Castle WPCF EN	NY0109584	N/A	Byram River	0.45	0.4	1,325	2.70
Northport (Village) EN	NY0024881	Northport Harbor, NY	Northport Harbor	0.45	0.2	1,491	3.90
Oyster Bay EN	NY0021822	Oyster Bay, NY	Oyster Bay	1.8	1.3	8,284	3.90
Port Chester WPCF EN	NY0026786	Byram River, NY	Long Island Sound	6	4.3	128,066	22.00
Port Jefferson (SCSD #1)	NY0021750	Port Jefferson Harbor, NY	Port Jefferson Harbor	1.15	0.7	3,645	4.50
Port Washington WN	NY0026778	Manhasset Bay, NY	Manhasset Bay	3.8	2.6	28,827	7.80
Red Hook WN	NY0027073	East River, NY	East River	60	26	646,131	17.90
SUNY (SCSD #21)	NY0206644	Port Jefferson Harbor, NY	Port Jefferson Harbor	2.5	167.33	6,627	0.05
Tallman Island WN	NY0026239	East River, NY	East River	80	57	778,671	9.80
Wards island WN	NY0026131	East River, NY	East River	275	206.5	2,468,552	8.60
Rhode Island							
Kenyon Industries, Inc.	RI0000191	Pawcatuck River, RI	Pawcatuck River	N/A	0.310	26,627	61.97

Facility	NPDES ID	Watershed	Receiving Water	Design Flow (MGD)	Actual Flow (MGD)	Load (kg N/yr)	Concentration (mg/L)
Westerly WWTF	RI0100064	Pawcatuck River, RI	Pawcatuck River	3.3	2.22	48,282	15.73
Vermont							
Bellows Falls CRW	VT0100013	N/A	Connecticut River	1.405	0.49	14,399	21.06
Bethel CRW	VT0100048	N/A	White River	0.125	0.12	3,250	19.60
Bradford CRW	VT0100803	N/A	Waits River	0.145	0.14	3,791	19.60
Brattleboro CRW	VT0100064	N/A	Connecticut River	3.005	1.82	50,540	20.06
Bridgewater CRW	VT0100846	N/A	Ottauquechee River	0.045	0.04	748	13.53
Canaan CRW	VT0100625	N/A	Connecticut River	0.185	0.18	4,967	19.97
Cavendish CRW	VT0100862	N/A	Black River	0.155	0.15	4,062	19.60
Chelsea CRW	VT0100943	N/A	White River	0.065	0.06	1,625	19.60
Chester CRW	VT0100081	N/A	Williams River	0.185	0.18	4,875	19.60
Cold Brook Fire Department CRW	VT0101214	N/A	Deerfield River	0.055	0.05	1,354	19.60
Danville CRW	VT0100633	N/A	Water Andric	0.065	0.06	1,625	19.60
FiberMark North America Inc. CRW	VT0000248	N/A	Connecticut River		0.888	13,509	10.88
Hartford (Quechee WWTF) CRW	VT0100978	N/A	Ottauquechee River	0.305	0.3	2,769	6.68
Hartford (White River Junction WWTF) CRW	VT0101010	N/A	Connecticut River	1.225	0.932	7,353	5.71
Ludlow CRW	VT0100145	N/A	Black River	0.705	0.7	1,141	1.18
Lunenburg CRW	VT0101061	N/A	Connecticut River	0.085	0.08	1,452	13.14
Lyndon CRW	VT0100595	N/A	Passumpsic River	0.755	0.75	20,311	19.60
Putney CRW	VT0100277	N/A	Sackett's Brook	0.085	0.08	2,167	19.60
Randolph CRW	VT0100285	N/A	Third Branch of the White River	0.405	0.4	10,833	19.60
Readsboro CRW	VT0100731	N/A	Deerfield River	0.755	0.75	20,311	19.60
Royalton CRW	VT0100854	N/A	White River	0.075	0.07	2,431	25.13
Saxtons River CRW	VT0100609	N/A	Saxtons River	0.105	0.1	2,708	19.60
Sherburne Fire District CRW	VT0101141	N/A	Ottauquechee River	0.305	0.3	8,125	19.60
Soundview Vermont Holdings LLC CRW	VT0000108	N/A	Connecticut River	N/A	0.180	4,334	17.15
Springfield (VT) CRW	VT0100374	N/A	Black River	2.2	1.08	18,022	12.06
St. Johnsbury CRW	VT0020826	N/A	Stiles Brook	1.6	1.17	19,442	12.06
Whitingham CRW	VT0101109	N/A	Harriman Reservoir	0.015	0.01	302	21.84
Whitingham Jacksonville CRW	VT0101044	N/A	North River	0.055	0.05	1,354	19.60
Wilmington CRW	VT0100706	N/A	North Branch Deerfield River	0.145	0.14	3,791	19.60
Windsor CRW	VT0100919	N/A	Connecticut River	1.135	0.35	9,562	19.60
Windsor-Weston CRW	VT0100447	N/A	Connecticut River	0.025	0.02	542	19.60
Woodstock WTP CRW	VT0100757	N/A	Ottauquechee River	0.455	0.45	12,187	19.60
Woodstock WWTP CRW	VT0100749	N/A	Kedron Brook	0.055	0.05	1,354	19.60
Woodstock-Taftsville CRW	VT0100765	N/A	Ottauquechee River	0.015	0.01	199	14.43

Notes: Cell color corresponds to the facility location.
CRW=Connecticut River watershed; EN=Eastern Narrows watershed; HRW=Housatonic River watershed; TRW=Thames River watershed; WN=Western Narrows watershed; WPCF= water pollution control facility; WTP= water treatment plant; WWTF= wastewater treatment facility; WWTP=wastewater treatment plant.

Sources Cited

Mullaney, J.R., and G.E. Schwarz. 2013. *Estimated Nitrogen Loads from Selected Tributaries in Connecticut Draining to Long Island Sound, 1999–2009*. USGS Scientific Investigations Report 2013-5171. U.S. Geological Survey. Accessed November 2016. https://pubs.usgs.gov/sir/2013/5171/pdf/sir2013-5171.pdf.

NYSDEC. 2015. *Determination of Regulated and Non-regulated Stormwater Loads to LIS from New York State*. New York State Department of Environmental Conservation, Division of Water, Albany.

Appendix B: Dischargers Compiled

See Excel file.