EXHIBIT C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT NUMBER: **MA0101613** [This draft permit is also integrating existing permit MA0103331[1]]

PUBLIC NOTICE START AND END DATES: **November 15, 2017 – December 14, 2017**

NAME AND MAILING ADDRESS OF APPLICANT:

Springfield Water and Sewer Commission
P.O. Box 995
Springfield, MA 01101-0995

The Massachusetts municipalities of Agawam, East Longmeadow, Longmeadow, Ludlow, West Springfield, and Wilbraham are co-permittees for specific activities required by the draft permit, as described in Section IX. of this Fact Sheet and as set forth in Sections I.C. and I.D. of the draft permit. The responsible municipal departments are:

Town of Agawam Department of Public Works 1000 Suffield St Agawam, MA 01001	**Town of East Longmeadow Department of Public Works 60 Center Square, 2nd Floor East Longmeadow, MA 01028**	**Town of Longmeadow Department of Public Works 31 Pondside Road Longmeadow, MA 01106**
Town of Ludlow Department of Public Works 198 Sportsmans Road Ludlow, MA 01056	**Town of West Springfield Department of Public Works 26 Central Street, Suite 17 West Springfield, MA 01089**	**Town of Wilbraham Department of Public Works 240 Springfield St. Wilbraham, MA 01095**

[1] See Section X of this Fact Sheet

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Springfield Regional Waste Water Treatment Facility ("SRWWTF" or the "Facility" or "Bondi Island")
Route 5 Bondi Island
Agawam, MA 01001

And

24 Combined Sewer Overflows located in Springfield and Agawam, MA

RECEIVING WATER(S):

Connecticut River
Chicopee River
Mill River

RECEIVING WATER CLASSIFICATION(S):
All receiving waters are **Class B – Warm Water Fishery**

Contents

Attachments

I. PROPOSED ACTION, TYPE OF FACILITY, AND DISCHARGE LOCATION

The Springfield Water and Sewer Commission ("SWSC" or the "Commission") has applied to the U.S. Environmental Protection Agency ("EPA") for reissuance of its National Pollutant Discharge Elimination System ("NPDES") permit to discharge into the designated receiving waters. The existing permit was issued on December 8, 2000 and expired in February 2006. A complete and timely application for the permit re-issuance was submitted to EPA, and the existing permit was administratively continued pursuant to 40 C.F.R. § 122.6. Upon becoming effective, the draft permit and the authorization to discharge shall supersede the existing permit.

The existing permit authorizes the discharge from outfall 001 (formerly designated at outfall 041), which discharges treated municipal and industrial wastewater and stormwater from the SWSC's publicly owned treatment works ("POTW") to the Connecticut River. The SWSC also has been issued NPDES Permit No. MA0103331, which authorizes discharges of combined sanitary wastewater and stormwater from the Commission's 25 Combined Sewer Overflows ("CSOs") to the Connecticut, Chicopee and Mill Rivers. EPA's practice is to include CSO requirements in permits that authorize discharges from POTWs when the permittee owns and operates both a POTW and CSOs; therefore EPA is proposing to integrate the Commission's two NPDES permits into a single permit and terminate permit MA0103331. This is reflected in the conditions of the draft permit (see discussion of the separate permit in Section X of this Fact Sheet.). The locations of outfall 001 and the CSO outfalls are provided in **Attachments A** and **D**, respectively.

Additionally, EPA is adding six co-permittees to the draft permit. The towns of Agawam, Longmeadow, East Longmeadow, Ludlow, West Springfield and Wilbraham, Massachusetts own and operate sanitary wastewater collection systems that discharge flows to the SRWWTF for treatment[2]. These municipalities are co-permittees for certain activities pertaining to proper operation and maintenance of their respective collection systems (see Part I.C. and I.D of the draft permit). Adding them to the draft permit ensures that they comply with requirements to operate and maintain the collection systems so as to avoid discharges of sewage from the collection systems. These co-permittees did not apply for permit coverage; with letters sent November 3, 2015, EPA waived application requirements for the six co-permittees.

II. DESCRIPTION OF DISCHARGE

A quantitative description of the effluent discharged from outfall 001, based on recent monitoring data, is shown in **Attachment C**. Annual CSO discharge volumes from 2011-2016 are provided in **Attachment D.**

[2] Two other municipalities, the Town of Chicopee and the City of Springfield, contribute flows to the SWSC's collection system. Less than 1,000 residents in the Town of Chicopee are served by sewers discharging to the Commission's system; the remainder of the Town is served by a Town collection system and treatment plant. Because of the relatively small amount of sewers contributing flows, the Town of Chicopee was not added as a co-permittee. The City of Springfield also contributes sewage; however, all sanitary sewers in the City are owned and maintained by the Commission, not by the City. Therefore, the City is not a co-permittee.

III. RECEIVING WATER DESCRIPTION

The segments of the Connecticut River (segment MA34-05) and Mill River (segment MA34-29) at the points of discharge are located within the Connecticut River Basin. The segment of the Chicopee River into which several of the SWSC's CSO outfalls discharge (segment MA36-24) is located within the Chicopee River Basin. The Massachusetts Surface Water Quality Standards ("MA SWQS"), found at 314 Code of Massachusetts Regulations ("CMR") 4.06 Tables 6 and 8, classifies these river segments as Class B. The Connecticut and Chicopee Rivers are also classified as Warm Water Fisheries. The MA SWQS designate Class B Waters as having the following uses: (1) a habitat for fish, other aquatic life, and wildlife; (2) primary and secondary contact recreation; (3) a source of public water supply (i.e., where designated and with appropriate treatment); (4) suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses; and (5) shall have consistently good aesthetic value (314 CMR 4.05(3)(b)).

A warm water fishery is defined in the MA SWQS (314 CMR 4.02) as waters in which the maximum mean monthly temperature generally exceeds 20°C during the summer months and are not capable of supporting a year-round population of cold-water stenothermal aquatic life.

The segments of the receiving waters into which the discharges occur are identified in the MA SWQS with a CSO qualifier, indicating that these waters "are identified as impacted by the discharge of combined sewer overflows; however, a long term control plan has not been approved or fully implemented for the CSO discharges" 314 CMR 4.06(1)(d)(10).

Sections 303(d) and 305(b) of the Clean Water Act ("CWA") require that states complete a water quality inventory and develop a list of impaired waters. Specifically, section 303(d) requires states to identify those waterbodies that are not expected to meet water quality standards following the implementation of technology-based controls and, as such, require the development of a total maximum daily load ("TMDL"). In Massachusetts, these two evaluations have been combined into an Integrated List of Waters. The integrated list format provides the status of all assessed waters in a single, multi-part list.

The Final *Massachusetts Year 2014 Integrated List of Waters (MassDEP 2015)*(the "*2014 Integrated List*"), lists the segment of the Connecticut River into which outfall 001 and combined sewer overflow outfalls # 007, 008, 010, 011, 012, 013, 014, 015A, 015B, 016, 018, 042 and 049 discharge (segment MA 34-05) as a Category 5 water (waters requiring a TMDL for pollutants identified as causing impairment(s)). The pollutants listed as causing the impairment(s) and requiring a TMDL are *E. coli*, total suspended solids, and PCBs in fish tissue (*2014 Integrated List*). The segment of the Mill River into which combined sewer overflow outfalls #017, 019, 024, 025, 045, 046 and 048 discharge (segment 34-29) is listed as a category 5 water due to impairment(s) caused by *Escherichia coli (E. coli*). The segment of the Chicopee River into which combined sewer outfalls #034, 035, 036A and 037 discharge (segment 36-24) is listed as a Category 5 water due to impairment(s) caused by fecal coliform.

IV. LIMITATIONS AND CONDITIONS

The effluent limitations of the draft permit, the monitoring requirements, and any implementation schedule (if required) may be found in the draft permit.

V. PERMIT BASIS: STATUTORY AND REGULATORY AUTHORITY

Congress enacted the Clean Water Act ("CWA") "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specified permitting sections of the CWA, one of which is Section 402. See CWA §§ 301(a), 402(a).

Section 402(a) established one of the CWA's principal permitting programs, the National Pollutant Elimination System ("NPDES"). Under this section of the CWA, EPA may "issue a permit for the discharge of any pollutant, or combination of pollutants" in accordance with certain conditions. See CWA § 402(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. See CWA § 402(a)(1)-(2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. See §§ 301, 304(b); 40 C.F.R. §§ 122, 125, 131. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Clean Water Act. For publicly owned treatment works ("POTWs"), technology-based requirements are effluent limits based on secondary treatment as defined in 40 C.F.R. 133.102.

EPA regulations require NPDES permits to contain effluent limits more stringent than technology-based limits where necessary to maintain or achieve federal or state water quality standards. Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The MA SWQS, 314 CMR 4.00, establish requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304 (a) of the CWA, shall be used unless a site-specific criterion is established. Massachusetts regulations similarly require that its permits contain limitations which are adequate to assure the attainment and maintenance of the water quality standards of the receiving waters as assigned in the MA SWQS. See 314 CMR 3.11(3). EPA is required to obtain certification from the state in which the discharge is located that all water quality standards or other applicable requirements of state law, in accordance with Section 301(b)(1)(C) of the CWA, are satisfied, unless the state certification is deemed to be waived.

In addition, a permit may not be renewed, reissued or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirements of CWA Section 402(o) and 40 C.F.R. §122.44(l). States are also required to develop antidegradation policies pursuant to 40 C.F.R. § 131.12. No lowering of water quality is allowed, except in accordance with the antidegradation policy.

VI. FACILITY INFORMATION

The Springfield Water and Sewer Commission's Bondi Island treatment plant processes wastewater from the following municipalities, with the population served for each one (based on information submitted in 2005)

Springfield	156983
Agawam	29000
West Springfield	25935
Ludlow	19596
Longmeadow	15409
East Longmeadow	14504
Wilbraham	13092
Chicopee	566

The wastewater collection system consists of both sanitary sewers, which transport domestic, industrial, and commercial wastewater; and combined sewers, which transport domestic, industrial, and commercial wastewater plus stormwater. Under normal flow conditions, wastewater is conveyed to the Facility through interceptor sewers. During wet weather events in which the combined flow exceeds the hydraulic capacity of the interceptor sewer and/or the wastewater treatment plant, discharges of untreated combined sanitary wastewater and stormwater occur from the CSOs listed in **Attachment D** to the Connecticut, Mill and Chicopee Rivers.

The SRWWTF is a publicly owned treatment works ("POTW") with an annual average design of flow 67 million gallons per day ("MGD"). The Facility has the capacity to provide primary treatment for flows up to 180 MGD and secondary treatment for flows up to 134 MGD.

The treatment process train includes mechanical screens, primary clarification, aerated biological treatment, secondary clarification, chlorine disinfection, dechlorination, sludge thickening and sludge dewatering. Treated effluent is discharged through outfall 001 to the Connecticut River. During wet weather events in which the secondary treatment capacity of the facility is exceeded, flows in excess of 134 MGD bypass secondary treatment (receiving only primary treatment, chlorination, and dechlorination) in order to prevent damage to the operation of the secondary treatment system. At this time, there no feasible alternatives to this bypass have been identified without the discharge of additional untreated sewage in system's CSOs. Alternatives continue to be evaluated as part of long term CSO abatement planning. In addition, flows in excess of 180 MGD are discharged from CSO Outfall 042 (receiving no treatment). Currently, continuous sampling of the effluent is carried out on the secondarily-treated flow, at a point before the secondary bypass flow rejoins. Grab samples for bacteria and Total Residual Chlorine are collected from a point after dechlorination and include flow that bypassed secondary treatment. The draft permit requires that all samples be collected after comingling of the secondary effluent with flow that bypassed secondary treatment. A flow process diagram of the facility is provided in **Attachment B**. The facility is operated by SUEZ Water Environmental Services, Inc. under a twenty-year Service Agreement begun with the Commission in 2000.

VII. DERIVATION OF EFFLUENT LIMITS UNDER THE FEDERAL CWA AND THE COMMONWEALTH OF MASSACHUSETTS WATER QUALITY STANDARDS

EFFLUENT FLOW

The draft permit maintains the 12 month rolling average effluent flow limitation of 67 MGD that is in the current permit. This limit is based upon the annual average design flow of the facility, as reported in Form 2A, Part A, Section a.6. of the permit application. The draft permit requires continuous flow measurement, and also requires reporting of the average monthly and maximum daily flows. Effluent flow data that was collected and submitted by the permittee from 2011-2015 is shown in **Attachment C**.

Sewage treatment plant discharge is encompassed within the definition of “pollutant” and is subject to regulation under the CWA. The CWA defines “pollutant” to mean, inter alia, “municipal . . . waste” and “sewage…discharged into water.” 33 U.S.C. § 1362(6).

EPA may use design flow of effluent both to determine the necessity for effluent limitations in the permit that comply with the Act, and to calculate the limits themselves. EPA practice is to use design flow as a reasonable and important worst-case condition in EPA’s reasonable potential and water quality-based effluent limitations (“WQBEL”) calculations to ensure compliance with water quality standards under Section 301(b)(1)(C). Should the effluent discharge flow exceed the flow assumed in these calculations, the instream dilution would decrease and the calculated effluent limits may not be protective of WQS. Further, pollutants that do not have the reasonable potential to exceed WQS at the lower discharge flow may have reasonable potential at a higher flow due to the decreased dilution. In order to ensure that the assumptions underlying the Region’s reasonable potential analyses and derivation of permit effluent limitations remain sound for the duration of the permit, the Region may ensure its “worst-case” effluent wastewater flow assumption through imposition of permit conditions for effluent flow. Thus, the effluent flow limit is a component of WQBELs because the WQBELs are premised on a maximum level of flow. In addition, the flow limit is necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQS.

Using a facility’s design flow in the derivation of pollutant effluent limitations, including conditions to limit wastewater effluent flow, is consistent with, and anticipated by, NPDES permit regulations. Regarding the calculation of effluent limitations for POTWs, 40 C.F.R. § 122.45(b)(1) provides, “permit effluent limitations…shall be calculated based on design flow.” POTW permit applications are required to include the design flow of the treatment facility. Id. § 122.21(j)(1)(vi).

Similarly, EPA’s reasonable potential regulations require EPA to consider “where appropriate, the dilution of the effluent in the receiving water,” 40 C.F.R. § 122.44(d)(1)(ii), which is a function of both the wastewater effluent flow and receiving water flow. EPA guidance directs that this “reasonable potential” analysis be based on “worst-case” conditions. EPA accordingly is authorized to carry out its reasonable potential calculations by presuming that a plant is operating at its design flow when assessing reasonable potential.

The limitation on sewage effluent flow is within EPA's authority to condition a permit in order to carry out the objectives of the Act. See CWA §§ Sections 402(a)(2) and 301(b)(1)(C); 40 C.F.R. §§ 122.4(a) and (d); 122.43 and 122.44(d). A condition on the discharge designed to protect EPA's WQBEL and reasonable potential calculations is encompassed by the references to "condition" and "limitations" in 402 and 301 and implementing regulations, as they are designed to assure compliance with applicable water quality regulations, including antidegradation. Regulating the quantity of pollutants in the discharge through a restriction on the quantity of wastewater effluent is consistent with the overall structure and purposes of the CWA.

In addition, as provided in Part II.B.1 of the draft permit and 40 C.F.R. § 122.41(e), the permittee is required to properly operate and maintain all facilities and systems of treatment and control. Operating the facilities wastewater treatment systems as designed includes operating within the facility's design effluent flow. Thus, the permit's effluent flow limitation is necessary to ensure proper facility operation, which in turn is a requirement applicable to all NPDES permits. See 40 C.F.R. § 122.41.

Dilution Factor

Water quality-based limitations are established with the use of a calculated available dilution factor. 314 CMR 4.03(3)(a) of the MA SWQS requires that effluent dilution be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, recorded over a 10-year recurrence interval. Additionally, the plant's design flow is used to calculate available effluent dilution.

The 7Q10 flow data used to calculate the proposed effluent limitations in the draft permit is based on measurements of flow in the Connecticut River above the Springfield WWTP, which was collected by the United States Geological Survey (USGS) gaging station 01170500 on the Connecticut River at Montague City, MA (period of record 1985-2015), as well as estimates of the drainage basin area above the outfall. The drainage basin area at the outfall (9,088 mi^2) was estimated by adding the drainage area of the Connecticut River, 1.1 mile upstream from the Westfield River (9,055 mi^2), to the drainage area of the Mill River, just upstream of the outfall (33 mi^2)[3]

The 7Q10 flow at the USGS gaging station 01170500 was divided by the drainage area in the river at the location of the station (7,860 mi^2) to derive a flow factor. This flow factor was then multiplied by the drainage area of the Connecticut River where outfall 001 is located to calculate a 7Q10 value of 2,435 cubic feet per second ("cfs") just above outfall 001. See Table 1.

[3] *Gazetteer of Hydrologic Characteristics of Streams in Massachusetts; Connecticut River Basin*. U.S. Geological Survey, Water-Resources Investigations Report 84-4282. 1984.

Table 1: Calculation of 7Q10 at Outfall 001 (formerly 041)

	USGS Gage 01170500	Just Above Outfall 001
Drainage Area (mi^2)	**7,860**	**9,088**
7Q10 (cfs)	**2,103**	**2,435**
Flow Factor (cfs/mi^2)	**0.268**	**NA**

The available dilution (dilution factor) at the point of discharge was then derived from the design flow of the facility (67 MGD) and the estimated 7Q10 at the point of discharge (2,435 cfs) as follows:

Dilution = (design flow (cfs) + $7Q10_{0utfall\ 041}$ (cfs)) / design flow of facility

Design Flow in cfs = (67 MGD * 1.55 cfs/MGD) = 103.8 cfs

Dilution Factor = (103.8 cfs + 2,435 cfs) / 103.8 cfs = 24

CONVENTIONAL POLLUTANTS

Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS)

Effluent concentration limits for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) are technology-based limits based on the minimum level of effluent quality attainable by secondary treatment as set forth in 40 C.F.R. §133.102(a) and (b), respectively.

The requirements of 40 C.F.R. §133.102(a) and (b), which provide for effluent limits for BOD_5 and TSS of 30 mg/l (average monthly) and 45 mg/l (average weekly), are reflected in the draft permit. The draft permit also includes mass-based limits for BOD_5 and TSS, in accordance with the requirements of 40 C.F.R. §122.45(f). Mass loads for BOD_5 and TSS are calculated from concentration limits and the design flow, as shown below:

L = C x Q x 8.34

Where:

L = Mass loading (lbs/day)
C = Effluent concentration (limit) (mg/l)
Q = Design flow of the facility (MGD)
8.34 = Factor to convert effluent concentration, in mg/l, and design flow, in MGD, to lbs/day.

Average Monthly Mass Limit = 30 mg/l x 67 MGD X 8.34 = 16,763 lbs/day

Average Weekly Mass Limit = 45 mg/l x 67 MGD X 8.34 = 25,145 lbs/day

These concentration and mass-based limits are unchanged from the existing permit.

Percent removal requirements are also included in the secondary treatment standards of 40 C.F.R. §133.102(a)(3) and (b)(3), requiring that the average monthly percent removal for BOD_5 and TSS be not less than 85%. However, combined sewer systems may receive case-by-case consideration under 40 C.F.R. §133.103(a), which states:

> *Treatment works subject to this part may not be capable of meeting the percentage removal requirements . . . during wet weather where the treatment works receive flows from combined sewers (i.e. sewers which are designed to transport both storm water and sanitary sewage). For such treatment works, the decision must be made on a case-by-case basis as to whether any attainable percentage removal level can be defined, and if so, what the level should be.*

Additionally, 40 C.F.R. §133.103(e) states

> *The Regional Administrator or, if appropriate, the State Director is authorized to substitute either a lower percent removal requirement or a mass loading limit for the percent removal requirements set forth in §§ 133.102(a)(3), 133.102(a)(4)(iii), 133.102(b)(3), 133.105(a)(3), 133.105(b)(3) and 133.105(e)(1)(iii) provided that the permittee satisfactorily demonstrates that: (1) The treatment works is consistently meeting, or will consistently meet, its permit effluent concentration limits, but the percent removal requirements cannot be met due to less concentrated influent wastewater; (2) to meet the percent removal requirements, the treatment works would have to achieve significantly more stringent effluent concentrations than would otherwise be required by the concentration-based standards; and (3) the less concentrated influent wastewater does not result from either excessive infiltration or clear water industrial discharges during dry weather periods.*

The existing permit suspended the 85% removal requirement because the large area of combined system makes meeting the requirement difficult in wet weather.

EPA's general approach has been to suspend the percent removal requirements in wet weather only for CSO areas. There is no documentation that the percent removal requirements cannot be met in dry weather by the treatment works (in fact, using a monthly average that includes both wet and dry weather, the treatment works have met the percent removal requirement every month in the last five years). Therefore, the draft permit suspends the 85% removal requirement during wet weather, but implements the requirement during dry weather.

The Connecticut River is listed as impaired for TSS. The state water quality standard for suspended solids, at 314 CMR 4.05(3)(b)5, states

> *These waters shall be free from floating, suspended and settleable solids in concentrations and combinations that would impair any use assigned to this Class, that would cause*

aesthetically objectionable conditions, or that would impair the benthic biota or degrade the chemical composition of the bottom.

In addition to the numeric technology-based limitations in the draft permit for TSS, EPA has included narrative water quality limits and conditions in Parts I.A.1.a., c., and d. of the draft permit to limit solids discharged from this facility and to ensure attainment of the water quality standard established at 314 CMR 4.05(3)(b)5.

BOD_5 and TSS influent and discharge data from 2011-2015 is shown in **Attachment C**. There have been no reported exceedances for BOD_5 or TSS limits at the facility in that time.

pH

The technology-based secondary treatment requirements for pH are a minimum of 6.0 and maximum of 9.0 SU (40 C.F.R. §133.102(c)). The MA SWQS establishes that for class B waters, pH "[s]hall be in the range of 6.5 through 8.3 standard units and not more than 0.5 units outside of the natural background range." (314 CMR 4.05(4)(b)3).

The pH limits in the existing permit, which are a minimum of 6.5 standard units and a maximum of 8.3 standard units, are maintained in the draft permit, and are a condition of state certification.

Discharge data for pH for 2011-2015 is shown in **Attachment C**. There have been no reported exceedances for pH limits at the facility in that time.

Bacteria

Limitations for fecal coliform bacteria in the existing permit are based upon state water quality standards to protect seasonal recreational uses that were in effect at the time that permit was issued.

The bacteria limits are modified in the draft permit to reflect the new seasonal *Escherichia coli (E. coli*) recreational criteria in the revisions to the MA SWQS, 314 CMR 4.05(3)(b), approved by EPA in 2007. The monthly average limitation in the draft permit is 126 colony forming units ("cfu") per 100 ml, and shall be expressed as a monthly geometric mean. The daily maximum limitation in the draft permit is 409 cfu/100 ml (this is the 90% distribution of the geometric mean of 126 cfu/100ml).

The February 23, 1990, *Massachusetts Water Quality Standards Implementation Policy For The Control Of Toxic Pollutants In Surface Waters* requires disinfection "seasonally (April 1 through October 15) in segments designated for primary contact recreation". The *E. coli* limits in the draft permit are in effect from April 1 through October 31, which is the same seasonality as the bacteria limits in the existing permit and protect recreational uses during the bathing season.

The monitoring frequency is maintained at five times per week.

Bacteria discharge data from 2011-2015 is shown in **Attachment C.** There has been only a single reported exceedance for bacteria limits at the facility from 2011-2015 (occurring in June 2015).

NON-CONVENTIONAL AND TOXIC POLLUTANTS

Total Residual Chlorine ("TRC")
Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. Effluent limits are based on water quality criteria for total residual chlorine ("TRC") which Massachusetts adopted by reference to EPA's *2002 National Recommended Water Quality Criteria* (EPA-822-R-02-047). The acute and chronic fresh water aquatic life criteria for TRC are 19 μg/l (Criterion Maximum Concentration) and 11 μg/l (Criterion Continuous Concentration), respectively. Given a dilution factor of 24, the total residual chlorine limitations are calculated as follows:

Total Residual Chlorine Limitations based on criteria:

(acute criteria x dilution factor) = Acute (Maximum Daily) Limit[4]
(19 μg/l x 24) = 456 μg/l = 0.46 mg/l

(chronic criteria x dilution) = Chronic (Monthly Average) Limit
(11 μg/l x 24) = 264 μg/l = 0.26 mg/l

In the existing permit, Total Residual Chlorine limits are in effect April through October. It is expected that chlorine will only be used seasonally, during the period that bacteria limits are in effect. However, in order to fully protect aquatic life, the draft permit clarifies that the chlorine limit is in effect year-round and that effluent sampling for total residual chlorine is only required when chlorine is added to the treatment process.

TRC discharge data from 2011-2015 is shown in **Attachment C**.

Metals
The release of metals into surface waters from anthropogenic activities such as discharges from municipal wastewater treatment facilities can result in their accumulation to levels that are highly toxic to aquatic life. Therefore, it is imperative to evaluate the downstream effects of discharges of metals from POTWs. The results of metals analyses conducted on both the effluent and upstream receiving water in conjunction with Whole Effluent Toxicity tests from 2010-2015 were evaluated during the development of the draft permit (See **Attachment E**).

Metals may be present in both dissolved and particulate forms in the water column. Extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column. (https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter3.pdf. See section 3.6). As a result, water quality criteria are established in terms of dissolved metals. However, regulations at 40 C.F.R. 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals. This accounts for the potential for a transition from the particulate to dissolved form as the effluent mixes with the receiving water (*The Metals*

[4] The table in Part I.A. of the existing permit contains a typographical error in which the acute limit of 0.38 mg/l chlorine is in the "Average Weekly" column, rather than "Maximum Daily" column. The draft permit correctly sets the acute limit as a Maximum Daily limit.

Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (USEPA 1996 [EPA- 823-B96-007]).

The applicable water quality criteria for metals are the *EPA National Recommended Water Quality Criteria 2002* (USEPA 2002 {EPA-822-R-02-047}), which have been incorporated into the Massachusetts SWQS by reference at 314 CMR 4.05 (5)(e). For cadmium, copper, nickel, lead and zinc the water quality criteria are hardness dependent. Because the reasonable potential analysis is performed using dilution under 7Q10 conditions, a projected receiving water hardness under 7Q10 conditions is calculated using the same mass balance equations and the median hardness of the effluent (91 mg/l) and upstream receiving water (43 mg/l), as reported in WET test reports for analyses conducted between 2010 and 2015 (see **Attachment E**) for a calculated downstream hardness of 45 mg/l. The applicable criteria are shown below in table 1.

Table 1 Factors Used to Calculate Acute and Chronic Total Recoverable Metals Criteria

Metal	Parameters				Total Recoverable Criteria	
	ma	ba	mc	bc	Acute Criteria (CMC) (ug/L)	Chronic Criteria (CCC) (ug/L)
Aluminum	—	—	—	—	750	87
Cadmium	1.0166	-3.924	0.7409	-4.719	0.95	0.15
Copper	0.9422	-1.700	0.8545	-1.702	6.60	4.72
Lead	1.273	-1.46	1.273	-4.705	29.54	1.15
Nickel	0.846	2.255	0.846	0.0584	238.75	26.54
Zinc	0.8473	0.884	0.8473	0.884	60.91	60.91

* Acute Criteria (CMC) = exp{m_a*ln(hardness)+b_a}
** Chronic Criteria (CCC) = exp{m_c*ln(hardness)+b_c}

EPA analyzed the available effluent and receiving water metals data to determine whether these pollutants "are or may be discharged at a level that causes, has reasonable potential to cause, or contributes to an excursion above" the water quality standard. 40 C.F.R. 122.44(d)(1)(i).

The effluent was characterized using a statistical analysis of effluent metals data, as reported in WET test reports from 2010-2015 (see **Attachment E**), to establish the 95th percentile of the lognormal distribution of the effluent data, which represents the maximum effluent concentration that can be expected to occur 95 percent of the time (i.e., the upper bound of the lognormal distribution of the data). The statistical approach to characterizing the effluent is described in **Attachment F.**

The receiving water concentration of metals downstream from the discharge is calculated taking into account dilution at 7Q10 conditions, through a mass balance equation that accounts for metals concentrations in the Connecticut River upstream of the discharge as reported in the facility's WET test reports (**Attachment E**). The ambient aluminum, copper and lead results that were used in the reasonable potential analysis calculations shown in Table 2 were submitted by the SWSC during the permit development process following discussions with EPA regarding elevated sample results from

2010-2015, which would have resulted in a positive reasonable potential determination, as possibly being due to contamination introduced during sample collection and analysis. The recently-submitted data are from samples that were collected in August 2016 and September 2016 using clean sampling techniques.

The equation used to calculate the downstream metals concentration is as follows:

$$\text{Receiving water concentration } (C_r) = \frac{C_d * Q_d + C_s * Q_s}{(Q_d + Q_s)}\text{; where}$$

C_d = Upper bound effluent metals concentration data (95th percentile)
Q_d = Design flow of facility
C_s = Median metals concentration in [receiving water] upstream of discharge
Q_s = 7Q10 streamflow in [receiving water] upstream of discharge

The resultant in-stream concentrations (for both acute and chronic conditions) are then compared to the criteria for each metal. The results of this analysis with respect to aluminum, cadmium, copper, lead, nickel and zinc are shown below in Table 2.

As indicated in table 2, based on the 95th percentile of the distribution of effluent data and the median upstream concentrations, there is no reasonable potential (for either acute or chronic conditions) that the discharge of metals will cause or contribute to an exceedance of the applicable water quality criteria and, therefore, limitations for metals have not been included in the draft permit. The draft permit does, however, require the permittee to monitor for metals in conjunction with quarterly WET tests, as discussed below (see Whole Effluent Toxicity).

Table 2 Results of Reasonable Potential Analysis for Metals

Metal	Qd	Cd (95th Percentile)	Qs	Cs (Median)	Qr	Cr = (QdCd+QsCs)/Qr	Criteria		Acute Reasonable Potential	Chronic Reasonable Potential	Limits	
	MGD	ug/l	MGD	ug/l	MGD	ug/l	Acute (ug/l)	Chronic (ug/l)	Cd & Cr > Criteria	Cd & Cr > Criteria	Acute (ug/l)	Chronic (ug/l)
Aluminum	67	128	1574	44.5	1641	47.9	750	87	N	N	N/A	N/A
Cadmium		0		0		0.00	0.95	0.15	N	N	N/A	N/A
Copper		66		1.1		3.75	6.60	4.72	N	N	N/A	N/A
Lead		7.1		0		0.29	29.54	1.15	N	N	N/A	N/A
Nickel		68		5.5		8.05	238.75	26.54	N	N	N/A	N/A
Zinc		71.6		16.2		18.5	60.91	60.91	N	N	N/A	N/A

Nitrogen
It has been determined that excessive nitrogen loadings are causing significant water quality problems in Long Island Sound, including low dissolved oxygen. In December 2000, the Connecticut Department of Energy and Environmental Protection ("CT DEEP") completed a Total Maximum Daily Load ("TMDL") for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation ("WLA") for point sources and a Load Allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL. See TMDL--*A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound* (CT DEP 2000).

The TMDL targeted a 25% reduction in the TN from out-of-basin point source loadings at the time the TMDL was developed. The TMDL estimated baseline loading and targets for each watershed are shown on Table 3. In 2006, in order to facilitate the TMDL in out-of-basin NPDES permits, EPA completed an analysis of the out-of-basin point sources, using 2004-05 discharge data, to determine compliance with the TMDL requirement of a 25% reduction. As can be seen from the summary in Table 3, the total estimated loading from the Connecticut River was 13,836 lbs/day in 2004-2005. Of that amount, Springfield's annual average TN load was 1,648 lbs/day. The 2004-2005 estimated loadings for all of the out-of-basin facilities are provided in **Attachment G.**

Table 3 Estimated Baseline Out-Of-Basin Loadings of Total Nitrogen from the Connecticut, Housatonic and Thames Rivers

Basin	TMDL Baseline[5] (lbs/day)	TMDL Target[6] (lbs/day)	Estimated 2004-2005 Loading[7] (lbs/day)
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

As can be seen from Table 3, the overall TMDL target of a 25 percent aggregate reduction from baseline loadings to the Connecticut River above the Massachusetts-Connecticut border was met as of 2004-05. In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA has included permit conditions for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts are also required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that the aggregate 25% reduction is maintained. EPA has

[5] Estimated loading from TMDL (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998).
[6] Reduction of 25% from baseline loading.
[7] Estimated loading from 2004 – 2005 DMR data. Detailed summary is provided in Attachment G.

worked with the State of Vermont to ensure that similar requirements are included in its discharge permits.

The existing Springfield permit requires monthly monitoring for nitrogen (ammonia, nitrite and nitrate, and total Kjeldahl nitrogen). From 2012-2016, the annual average TN load discharged from this facility ranged from 1,650 lbs/day to 2,534 lbs/day and averaged 2,279 lbs/day. Nitrogen discharge data from 2001-2016 are shown in **Attachment H**.

Invitation for Public Comment on Three Options for Addressing Nitrogen Discharges from the Springfield Regional Wastewater Treatment Facility:

The draft permit proposes, in part I.H, special conditions requiring the facility to optimize system operation to meet an annual average mass-based TN optimization benchmark of 2,279 lbs/day. EPA invites the public to also comment on two alternatives to the optimization benchmark in the draft permit. No final determination with respect to nitrogen conditions has been made. Therefore, EPA encourages the public to comment on the benefits and/or drawbacks of all three options. EPA also welcomes the proposal of alternative approaches to ensuring that discharges of TN from the Springfield WWTF are consistent with the TMDL. The three options are summarized in Table 4 and described below.

Table 4 Options for Total Nitrogen Optimization Benchmarks

Option	Loading Benchmark	Concentration Benchmark
Draft Permit Proposal	2,279 lbs/day	None
Alternative 1	2,534 lbs/day	8 mg/L
Alternative 2	None	8 mg/L

Draft Permit TN Optimization Requirement

In order to ensure that the LIS TMDL waste load allocation for out-of-basin point sources continues to be met, the draft permit includes a requirement for the facility to continue to optimize operations to meet a benchmark based on the current annual average TN load of 2,279 lbs/day. This benchmark was derived by averaging the TN load discharged from the facility over the last five years (2012-2016).

The current annual average TN load is 631 lbs/day greater than the 2004-2005 estimated load from this facility. Applying the revised Springfield benchmark to the estimated 2004-2005 loading results in a revised estimated loading of 14,467 for the other facilities which is still less than the TMDL target for the Connecticut River of 16,254 lbs/day (see Table 5).

Table 5 Out-Of-Basin Loadings of Total Nitrogen from the Connecticut, Housatonic and Thames Rivers Accounting for Optimization Benchmark of 2,279 lb/day

Basin	TMDL Baseline[8] (lbs/day)	TMDL Target[9] (lbs/day)	Revised Estimated Loading[10] (lbs/day)
Connecticut River	21,672	16,254	14,467
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,633

Monitoring and reporting requirements have been included in the draft permit to ensure that there is no increase in discharges of total nitrogen from this facility compared to the existing annual average loading from this facility (2,279 lbs/day). This value is considered to be likely achievable by the permittee using existing facilities while still meeting the objectives of the TMDL. Specifically, the draft permit requires continued optimization of the treatment facility operations to enhance the removal of nitrogen in order to maintain the annual average mass discharge of total nitrogen at less than the existing mass loading of 2,279 lbs/day. In addition, the draft permit requires the permittee to submit an annual report which includes: a summary of activities related to optimizing nitrogen removal efficiencies; documents the nitrogen load discharged from the facility; and, for any year in which the annual average nitrogen load discharged from the facility exceeds 2,279 lbs/day, a description of what may have led to the increased loading (including any changes in influent flows/loads and any operational changes) and any supporting data.

EPA is aware of discussions between communities in the Springfield area regarding the consolidation and treatment of wastewater flows at the Springfield WWTP. Should a facility divert flows to the Springfield WWTF and terminate its NPDES permit, the TN mass loading optimization benchmark that was allocated to that facility could be applied to Springfield's TN optimization benchmark of 2,279 lbs/day that is proposed in the draft permit. This approach is consistent with the objectives of the TMDL, as there would not be a net increase in the TN load being discharged to the Connecticut River.

Nitrogen Optimization Benchmark Alternative 1

The first alternative includes an annual average concentration based optimization benchmark of 8 mg/L combined with a higher annual average mass based optimization benchmark of 2,534 lbs/day (which was the maximum annual average TN load discharged from the facility from 2012-2016 (See Attachment H.). This approach would provide Springfield with the flexibility necessary for some future growth without allocating all of the remaining assimilative capacity of the receiving water to

[8] Estimated loading from TMDL (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998).
[9] Reduction of 25% from baseline loading.
[10] Estimated loading from 2004 – 2005 DMR data, with the exception of the Springfield WWTF, whose loading was based on the average loading from 2012-2016 (2,279 lbs/day). See Attachments G and H.

one facility. Further, the TMDL target of a 25% reduction in TN loadings from baseline loadings would be achieved, since the estimated load to the Connecticut River from out-of-basin point sources would be 14,772 lbs/day[11]. This is less than the TMDL target of 16,254 lbs/day, allowing for non-POTW point source loadings as well as any possible new point source discharges.

Nitrogen Optimization Benchmark Alternative 2

The second alternative includes an annual average concentration based optimization benchmark of 8 mg/l without a specific load based benchmark to encourage a consistent level of treatment regardless of changes in flow at Springfield. An effluent TN concentration of 8 mg/l at Springfield's existing annual average effluent flow of 38 MGD (the average of the annual average effluent flow values from 2012-2016) results in an annual average mass loading of 2,535 lbs/day.

Based on current facility operation, the TMDL target of a 25% reduction in TN loadings from baseline loadings would be achieved, since recent data indicates that the estimated load to the Connecticut River from out-of-basin point sources has actually decreased well below the 2004-2005 estimate. The sum of the DMR TN data for out-of-basin discharges was 11,820 lbs/day in 2014 during a year when Springfield discharged 2,342 lbs/yr. Assuming other dischargers remain at 2014 levels and Springfield discharges 2,535 lbs/day, the total out-of-basin load would be 12,013 lbs/day which is still well below the 13,836 lbs/day estimate of out-of-basin loads from 2004-2005 data (see Table 3) and the TMDL target of 16,254 lbs/day. While modest increases in TN mass loading could be expected under this approach if Springfield adds additional sewer users, the total out-of-basin load is unlikely to be exceeded.

Future Nitrogen Limits

EPA and state agencies expect to update the estimate of all out-of-basin total nitrogen loads and may incorporate total nitrogen limits in future permit modifications or reissuances as may be necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. In December 2015, EPA signed a letter detailing an EPA Nitrogen Reduction Strategy. EPA's strategy recognizes that more work must be done to reduce nitrogen levels, further improve dissolved oxygen conditions, and attain other related water quality criteria necessary to meet designated aquatic life uses in Long Island Sound. EPA is working to establish thresholds for Western Long Island Sound and several coastal embayments, including the mouth of the Connecticut River. Documents regarding the EPA Nitrogen Reduction Strategy are available for public review on EPA's Long Island Sound website (http://longislandsoundstudy.net/issues-actions/water-quality/nitrogen-strategy/). Upon completion of establishing thresholds, allocations of total nitrogen loadings will be made where further reductions are necessary. If further reductions are needed for the Springfield discharge, a water quality-based limit will be added in a future permit action. EPA is exploring possible trading approaches and more details will follow in the future as part of the permitting process.

---

[11]An annual average TN load of 2,534 lbs/day is 886 lbs/day greater than the TN load discharged in 2004, which was used in EPA's 2006 analysis of out-of basin point sources to the CT River Watershed (see Table 3 and Attachments G and H). This increase would bring the total estimated loadings to the CT River from out-of-basin point sources to 14,772 lbs/day, which is below the TMD target of 16,254 lbs/day.

Ammonia
Ammonia can be toxic to aquatic life and is also an oxygen-demanding pollutant whose biological decomposition may cause reduced dissolved oxygen concentrations in the receiving water.

In addition to the ammonia effluent monitoring required under the existing permit, samples of the receiving water collected upstream from the discharge are also analyzed for ammonia in conjunction with whole effluent toxicity (WET) testing. Effluent and ambient ammonia monitoring data from 2010-2015 are provided in **Attachments C and G**.

The applicable Massachusetts ammonia criteria are those found in the 1999 *Update of Ambient Water Quality Criteria for Ammonia*, as referenced in the EPA *National Recommended Water Quality Criteria 2002* (USEPA 2002 [EPA-822-R-02-047]), which were incorporated into the Massachusetts SWQS, 314 CMR 4.05(5)(e) by reference.

Acute criteria are a function of receiving water pH, and are calculated using two equations: one for waters where salmonids may be present; and another for waters where salmonids are not present[12]. Chronic criteria are calculated as a function of receiving water pH and temperature using two equations: one for waters where early life stages of fish are present and another for waters where early life stages of fish are absent. These criteria, as they relate to the Springfield WWTF's discharge, were calculated for both the summer (June 1 – October 31) and winter (November 1 – May 31) periods based on the presence of salmonids and early life stages of fish, and are presented in Table 3. These equations, from the 1999 *Update of Ambient Water Quality Criteria for Ammonia*, as referenced in the EPA *National Recommended Water Quality Criteria 2002* (USEPA 2002 [EPA-822-R-02-047]), are shown below.

$$CMC = \frac{0.275}{1 + 10^{7.204-pH}} + \frac{39.0}{1 + 10^{pH-7.204}}$$

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688-pH}} + \frac{2.487}{1 + 10^{pH-7.688}}\right) * MIN(2.85, (1.45*10^{0.028(25-T)})$$

Using the median pH value for ambient water in WET tests, and assumptions for temperature, the criteria are therefore.

[12]Equations for calculating acute (CMC) and chronic (CCC) criteria are found in the 1999 *Update of Ambient Water Quality Criteria for Ammonia*, as referenced in the EPA *National Recommended Water Quality Criteria 2002* (USEPA 2002 [EPA-822-R-02-047]).

Acute Criteria (CMC) = $(0.275/1+10^{7.204-pH}) + (39.0/1+10^{pH-7.204})$

Chronic Criteria (CCC) = $\{(0.0577/1+10^{7.688-pH}) + (2.487/1+10^{pH-7.688})\} * MIN (2.85, 1.45*10^{0.028*(25-T)})$

Table 6 Freshwater Ammonia Criteria

Season	Warm (June 1-Oct 31)	Cold (Nov 1-May 31)
Receiving Water pH, SU	6.9	6.9
Water Temperature, C	25	10
Fish Early Life Stages	Present	Present
Salmonids	Present	Present
Acute Criteria (mg/l as N)	26.2	26.2
Chronic Criteria (mg/l as N)	2.1	6.1

Reasonable Potential Analysis

EPA ammonia criteria recommend using the 30Q10 flow conditions in the receiving water (the lowest 30-day average daily flow with a 10-year expected recurrence interval) when establishing effluent limits. The 30Q10 flow data was not immediately available, so the analysis was done with the 7Q10 flow data. The 7Q10 flow (lowest 7-day average daily flow with 10-year expected recurrence) will be lower than 30Q10, providing less dilution. Therefore, if there is no reasonable potential to exceed water quality standards in stream with 7Q10 flow, there is no reasonable potential with 30Q10.

EPA evaluated the available effluent and ambient ammonia data for winter and summer to determine whether reasonable potential exists for the discharge to cause or contribute to instream excursions above the applicable ammonia criteria under 7Q10 conditions with effluent flow equal to design flow. From 2010 – 2015, the ambient median ammonia concentration from WET testing during the summer period (April through October) was 0.110 mg/l and the 95th percentile ammonia concentration of the effluent was 8.50 mg/l. The ambient median concentration of ammonia detected during this time period in the winter (November through March) was 0.235 mg/l and the 95th percentile concentration detected in samples of the effluent was 11.2 mg/l (see **Attachments C** and **G**). Using the formula below, the projected downstream ammonia concentrations from April through October, and from November through March, were calculated.

$$Q_dC_d + Q_sC_s = Q_rC_r$$

Where:

C_r = resultant downstream ammonia concentration (mg/l)
Q_d = effluent flow (design flow = 67 MGD)
C_d= 95th percentile effluent ammonia concentration (mg/l)
Q_s = upstream 7Q10 flow (1574 MGD)
C_s = median instream ammonia concentration, upstream from the discharge (mg/l)
Q_r = 7Q10 flow just downstream from the discharge ($Q_r = Q_s + Q_d$= 1641 MGD)

$$C_r = (Q_sC_s + Q_dC_d) / Q_r$$

The projected downstream concentrations of ammonia in the summer and winter periods, during the less-diluted 7Q10 conditions, are 0.46 and 0.68 mg/l, respectively, which are below both the acute and chronic criteria. Therefore, reasonable potential does not exist for the discharge of ammonia from the Facility to cause or contribute to a violation of water quality standards under critical flow (7Q10 or 30Q10 flows in the receiving water and effluent flow equal to the Facility's design flow) conditions.

The monitoring requirements for Nitrogen species are being increased to once per week in the draft permit from once per month in the existing permit in order to adequately evaluate discharges (see Nitrogen discussion above) and to ensure that discharges of ammonia from the facility remain below the level at which the receiving water would be negatively impacted.

<u>Whole Effluent Toxicity</u>
National studies conducted by EPA have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents and aromatic hydrocarbons among others. The Region's current policy is to include toxicity testing requirements in all municipal permits, while Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts

Based on the reasonable potential for toxicity resulting from domestic and industrial contributions, the low level of dilution at the discharge location, water quality standards, and in accordance with EPA regulation and policy, the draft permit includes chronic and acute toxicity limitations and monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784 (July 24, 1985); see also, EPA's Technical Support Document for Water Quality-Based Toxics Control). EPA Region I has developed a toxicity control policy. The policy requires wastewater treatment facilities to perform toxicity bioassays on their effluents. The MassDEP requires bioassay toxicity testing for state certification.

Pursuant to EPA Region I Policy, and MassDEP's *Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (February 1990), dischargers having a dilution factor greater than 20 and less than or equal to 100 are required to conduct acute toxicity testing four times per year.
In accordance with the above guidance, the acute toxicity limit (LC50 of > 100%) in the existing permit has been maintained in the draft permit. Toxicity testing shall be conducted quarterly, during the months of March, June, September and December. Tests shall be conducted using the daphnid, Ceriodaphnia dubia, as the test organism and shall be performed in accordance with the Acute and Chronic WET test procedures included as **Attachments A** and **B**, respectively, to the draft permit.

The results of WET tests conducted from 2010 through 2015 indicate the facility had no violations of the WET permit limits. The results of WET tests that were conducted from 2010-2015 are provided in **Attachment C**.

EPA and MassDEP may use the results of the toxicity tests and chemical analyses conducted by the permittee, required by the permit, as well as national water quality criteria, state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants.

The draft permit adds requirements for the reporting of several selected parameters, including ammonia nitrogen (as N); hardness; alkalinity; and total recoverable aluminum, cadmium, copper, lead, nickel, and zinc, the results of which are determined through analyses conducted on samples of the 100 % effluent sample in conjunction with WET tests.

VIII. INDUSTRIAL PRETREATMENT PROGRAM

The permittee is required to administer a pretreatment program based on the authority granted under 40 C.F.R. 122.44(j), 40 C.F.R. Part 403 and Section 307 of the Act. The permittee's pretreatment program received EPA approval on December 9, 1998 and, as a result, appropriate pretreatment program requirements were incorporated into the previous permit, which were consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

The Federal Pretreatment Regulations in 40 C.F.R. Part 403 were amended in October 1988, in July 1990, and again in October 2005. Those amendments established new requirements for implementation of pretreatment programs. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with current Federal Regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

In addition to the requirements described above, the draft permit requires the permittee to submit to EPA in writing, within 180 days of the permit's effective date, a description of proposed changes to permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the draft permit to ensure that the pretreatment program is consistent and up-to-date with all pretreatment requirements in effect. Lastly, the permittee must continue to submit, annually by March 31st, a pretreatment report detailing the activities of the program for the twelve-month period ending 60 days prior to the due date.

IX. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

EPA regulations set forth a standard condition for "Proper Operation and Maintenance" that is included in all NPDES permits. See 40 C.F.R. § 122.41(e). This condition is specified in Part II.B.1 (General Conditions) of the draft permit and it requires the proper operation and maintenance of all wastewater treatment systems and related facilities installed or used to achieve permit conditions.

EPA regulations also specify a standard condition to be included in all NPDES permits that specifically imposes on permittees a “duty to mitigate.” See 40 C.F.R. § 122.41(d). This condition is specified in Part II.B.3 of the draft permit and it requires permittees to take all reasonable steps –

which in some cases may include operations and maintenance work - to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment.

Proper operation of collection systems is critical to prevent blockages and equipment failures that would cause overflows of the collection system (sanitary sewer overflows, or SSOs), and to limit the amount of non-wastewater flow entering the collection system (inflow and infiltration or I/I). I/I in a collection system can pose a significant environmental problem because it may displace wastewater flow and thereby cause, or contribute to causing, SSOs. Moreover, I/I could reduce the capacity and efficiency of the treatment plant and cause bypasses of secondary treatment. Therefore, reducing I/I will help to minimize any SSOs and maximize the flow receiving proper treatment at the treatment plant. MassDEP has stated that the inclusion in NPDES permits of I/I control conditions is a standard State Certification requirement under Section 401 of the CWA and 40 C.F.R. § 124.55(b). Therefore, specific permit conditions have been included in Part I.B. and I.C. of the draft permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling infiltration and inflow to the extent necessary to prevent SSOs and I/I-related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary. These requirements are intended to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment.

Several of the requirements in the draft permit were not included in the existing permit, including collection system mapping, and preparation of a collection system operation and maintenance plan. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of the collection system and has included schedules for completing these requirements in the draft permit.

Because the municipalities of Agawam, East Longmeadow, Longmeadow, Ludlow, West Springfield, and Wilbraham each own and operate collection systems that discharge to the SRWWTF, these municipalities have been included as co-permittees for the specific permit requirements discussed in the paragraph above. The historical background and legal framework underlying this co-permittee approach is set forth in **Attachment I** to this Fact Sheet, EPA Region 1 NPDES Permitting Approach for Publicly Owned Treatment Works that Include Municipal Satellite Sewage Collection Systems.

X. COMBINED SEWER OVERFLOWS

Description

The wastewater collection system that conveys flow to the SRWWTF consists partially of combined sewers that convey both sanitary sewage and stormwater runoff during rain events. During wet weather, the combined flow exceeds the capacity of the interceptor sewers and the wastewater treatment plant, and a portion of the combined flow is discharged to the Connecticut, Chicopee, and Mill Rivers through combined sewer overflows (CSOs). CSOs have been identified as a significant source of pollution to the Connecticut and Chicopee Rivers. See *2003 Connecticut River Water Quality Assessment Report* (MassDEP 2003) and *Chicopee River Watershed 2003 Water Quality Assessment Report* (MassDEP, October 2008).

The system currently has 24 CSO outfalls which discharge to the Connecticut, Mill and Chicopee Rivers (see list in **Attachment D**). CSO 042, which is the CSO outfall located at the treatment plant, was inadvertently omitted from the list of outfalls from which discharges are authorized by the existing CSO permit. It is incorporated here for completeness.

Attachment D includes CSO discharge data for 2011-2016. In 2016, the system had combined overflows of 160 million gallons, as well as discharges of 6.7 million gallons of partially treated sewage from the treatment plant through a CSO-related bypass of secondary treatment.

SWSC CSO Permitting History

In 1995, EPA issued a separate permit for discharges from the CSOs (NPDES Permit No. MA010333 ("CSO permit")). The City of Springfield, which at that time owned and operated both the treatment plant and the collection system, had requested separate permits because different divisions within the City were responsible for the treatment plant and the collection system. In 1996, the Springfield Water and Sewer Commission was established and it subsequently took ownership of both the treatment plant and the collection system in the City of Springfield (while ownership of satellite collection systems remains with those municipalities). The CSO permit was re-issued on September 30, 2009. Because the City of Springfield no longer operates either the treatment plant or collection system, there is no longer a reason for separate permits. EPA's general practice is to integrate treatment plant and CSO authorization in a single permit, therefore this draft permit integrates authorization for CSO discharges into the current treatment plant permit and EPA is proposing to terminate the existing CSO permit, and incorporate the CSO requirements into this draft permit.

Regulatory Framework

CSOs are point sources subject to NPDES permit requirements for both water-quality based and technology-based requirements but are not subject to the secondary treatment regulations applicable to publicly owned treatment works in accordance with 40 C.F.R. §133.103(a). Section 301(b)(1)(C) of the Clean Water Act of 1977 mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Water Quality Act Amendments of 1987 (WQA). The framework for compliance with Clean Water Act requirements for CSOs is set forth in EPA's National CSO Control Policy, 59 Fed. Reg. 18688 (1994). It sets the following objectives:

1) To ensure that if the CSO discharges occur, they are only as a result of wet weather;
2) To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the CWA and applicable federal and state water quality standards; and
3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

Among the elements established to achieve these objectives, the CSO Policy set forth the minimum BCT/BAT controls (i.e., technology-based limits) that represent the BPJ of the Agency on a consistent, national basis. These are the Nine Minimum Controls ("NMCs") defined in the CSO Policy and set forth in Part I.B. of the draft permit: (1) proper operation and regular maintenance programs for the sewer system and the combined sewer overflows; (2) maximum use of the collection system for storage; (3) review and modification of the pretreatment programs to assure CSO impacts are minimized; (4) maximization of flow to the POTW for treatment; (5) prohibition of dry weather overflows; (6) control of solid and floatable materials in CSOs; (7) pollution prevention programs which focus on contaminant reduction activities; (8) public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

To reflect advances in technologies, the draft permit includes more specific public notification implementation level requirements to ensure that the public receives adequate notification of CSO occurrences and CSO impacts. The draft permit requires the permittee to develop a public notification plan to fulfil NMC #8. As part of this plan, notification shall be provided electronically to any interested party, and a posting made on the permittee's website, of a probable CSO activation within 24 hours of the initiation of any CSO discharge(s). Subsequently, within 24 hours of the termination of any CSO discharges(s), the permittee shall provide follow-up information on their website and in a follow-up electronic communication to any interested party. EPA invites comment on this new requirement during the public comment period with a goal of a workable public notification plan.

The Commission submitted documentation of its plan for implementing the Nine Minimum Controls, titled "Nine Minimum Control Measures Report" in 1997.

The CSO Policy also recommended that each community that has a combined sewer system develop and implement a long-term CSO control plan ("LTCP") that will ultimately result in compliance with the requirements of the CWA. The Commission submitted a Draft Long Term Control Plan Phase I Program in 2000, a revised draft LTCP in May 2012, and an Integrated Wastewater Plan (including an updated LTCP) in May 2014. The LTCP has not been completely approved. The SWSC is currently operating under federal administrative orders (latest being Administrative Order Docket No. 14-007 issued September 2014), requiring various projects to reduce or eliminate CSO discharges.

Permit Requirements

In accordance with the National CSO Policy, the draft permit contains the following conditions for the CSO discharges:

(i) Dry weather discharges from CSO outfalls are prohibited. Dry weather discharges must be immediately reported to EPA and MassDEP.

(ii) During wet weather, the discharges must not cause any exceedance of water quality standards.

(iii) The permittee shall meet the technology-based Nine Minimum Controls described above and shall comply with the implementation levels as set forth in Part I.B. of the draft permit.

(iv) The permittee shall review its entire NMC program and revise it as necessary. Documentation of this review and any resultant revisions made to the NMC program shall be submitted to EPA and MassDEP within 6 months of the effective date of the permit. An annual report shall be provided by April 30th of each year which describes any subsequent revisions made to the NMC program and shall also include monitoring results from CSO discharges, and the status of CSO abatement projects.

XI. SLUDGE

Section 405(d) of the CWA requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge that is land applied, disposed of in a surface disposal unit, or fired in a sewage sludge incinerator is subject to Part 503 technical standards. Part 503 regulations have a self-implementing provision, however, the CWA requires implementation through permits. Domestic sludge which is disposed of in municipal solid waste landfills are in compliance with Part 503 regulations provided the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 CFR §258. Sludge generated at the SRWWTF is trucked off site for disposal in a municipal solid waste landfill.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA-Region 1 has prepared a 72-page document entitled "EPA Region I NPDES Permit Sludge Compliance Guidance" for use by the permittee in determining their appropriate sludge conditions for their chosen method of sewage sludge use or disposal practices. This guidance document is available upon request from EPA Region 1 and may be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf. The permittee is required to submit an annual report to EPA and MassDEP, by February 19th each year, containing the information specified in the Sludge Compliance Guidance document for their chosen method of sewage sludge use or disposal practices.

XII. ESSENTIAL FISH HABITAT

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C.§ 1801 et seq. (1998)), EPA is required to consult with National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b). The Amendments broadly define "essential fish habitat" as waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. § 1802(10). Adverse impact means any impact, which reduces the quality and/or quantity of EFH. 50 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Essential fish habitat is only designated for fish species for which Federal Fisheries Management Plans exist. 16 U.S.C. § 1855(b)(1)(A). The U.S. Department of Commerce approved EFH designations for New England on March 3, 1999. Anadromous Atlantic salmon (*Salmo salar*) is the only managed species that would occur in the area which encompasses the discharge sites. The Connecticut River has been designated as EFH for Atlantic salmon adults, juveniles, and eggs and larvae. Observations of Atlantic salmon as far upstream as the Holyoke Dam from 2000 through 2014 have ranged from a low of 24 in 2001 to a high of 132 in 2005.[13] The USFWS discontinued its Atlantic salmon restocking program in 2012, although the state of Connecticut still stocks salmon in its rivers. Wild Atlantic salmon were observed spawning in the Farmington River in Connecticut for the first time in more than a century in 2015.

EPA has determined that the draft permit has been conditioned in such a way to be protective of EFH for Atlantic salmon for the following reasons:

- This permit action is a reissuance of an existing NPDES permit (i.e., not a new source of pollutants);
- The facility withdraws no water from the Connecticut River, so there is no potential for mortality to EFH species life stages from impingement or entrainment;
- Effluent dilution is calculated to be 24:1 under 7Q10 low flow conditions, and is likely much higher during wet weather when discharges from CSOs may occur;
- The draft permit prohibits discharges from CSOs during dry weather;
- The draft permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts;
- The draft permit prohibits a violation of water quality standards;
- Effluent limits and requirements were developed to be protective of aquatic life;
- Acute and chronic toxicity tests will be performed quarterly; and
- Limits specifically protective of aquatic organisms have been established for total residual chlorine based on water quality criteria.

EPA believes that the limitations and conditions in the draft permit adequately protect aquatic life, including those with designated EFH in the receiving water, and therefore additional mitigation is not warranted. If adverse impacts to EFH are detected as a result of this permit action, or if new information is received that changes the basis for our conclusion, NMFS will be notified and an EFH consultation will be initiated.

As a federal agency charged with authorizing the discharge from this facility, EPA has submitted the draft permit and fact sheet, along with a letter under separate cover, to NMFS Habitat Division.

XIII. ENDANGERED SPECIES ACT

The Endangered Species Act (ESA) of 1973, as amended, imposes requirements on Federal agencies related to the potential effects of their actions on endangered or threatened species of fish, wildlife, or plants (listed species) and their designated "critical habitat." Section 7 of the ESA requires, in general, that Federal agencies insure that any actions they authorize, fund, or carry out, in the United States or upon the high seas, are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated "critical habitat" for those species. Federal agencies carry out their responsibilities under the ESA in consultation with, and assisted by, the Departments of Interior (DOI) and/or Commerce (DOC), depending on the species involved. The

[13] Historic fish counts at Holyoke Dam reported by the Connecticut River Coordinator available at https://www.fws.gov/r5crc/Fish/hist.html.

United States Fish & Wildlife Service (USFWS) of the DOI administers Section 7 consultations for freshwater species, while the National Marine Fisheries Service (NMFS) of DOC does so for marine species and anadromous fish.

As the federal agency charged with authorizing the discharges from this facility, EPA has reviewed available habitat information developed by the Services to see if one or more of the federal endangered or threatened species of fish, wildlife, or plants may be present within the influence of the discharge.

Based on the information available, EPA has determined that subadult and adult Atlantic sturgeon (*Acipenser brevirostrum*) are unlikely to be present in the action area of this discharge. However, because individuals have been observed on rare occasions in the Connecticut River upstream of the discharge, EPA has evaluated the potential impacts to this species in its assessment. Subadult and adult shortnose sturgeon (*Acipenser oxyrinchus*) are likely to be present in the action area of this discharge. Early life stages of shortnose sturgeon are unlikely to be present in the action area, however, EPA has considered the potential impacts to early life stages in its assessment as rare occurrences have been reported. In addition to the listed species described above, NMFS designated critical habitat for the Atlantic sturgeon in the Connecticut River from the mouth to the Holyoke Dam (New York Bight Unit 1 Connecticut River), effective September 18, 2017, which includes the action area. *See* 82 Fed. Reg. 39160 (August 17, 2017).

The dwarf wedgemussel (*Alasmidonta heterodon*) has been extirpated from most New England rivers but still has a viable population on the upper Connecticut River in Vermont and New Hampshire.[14] Dwarf wedgemussels have been observed in tributaries of the Connecticut River in Hampshire County, Massachusetts upstream of the action area. The Fort River, more than 16 miles upstream from the action area, currently supports a small population of dwarf wedgemussel. In addition, the Mill River in Northampton and Hatfield, MA sustains a patchily distributed population of dwarf wedgemussel. [15] The Mill River (and its tributaries) that support this population is not the same Mill River (in Springfield and Wilbraham) that receives discharges from the CSOs at issue. Dwarf wedgemussels rely on host fish species, such as tessellated darter, for dispersing larval stages (glochidia). McLain and Ross (2005) suggest that low host dispersal may result in patchy distributions of mussels over relatively small areas (such as those observed in the tributaries of the Connecticut River) and may inhibit natural recolonization and recovery of this species. Based on the

[14] Nedeau, E. 2009. Distribution, threats, and conservation of the dwarf wedgemussel (*Alasmidonta heterodon*) in the middle and northern macrosites of the Upper Connecticut River. Prepared for Vermont Fish and Wildlife Department and New Hampshire Fish and Game. April 2009.

U.S. Fish and Wildlife Service. 1993. Dwarf Wedgemussel (*Alasmidonta heterodon*) Recovery Plan. Region 5 USFWS. February 1993.

[15] U.S. Fish and Wildlife Service. 2013. Dwarf Wedgemussel (*Alasmidonta heterodon*) 5 Year Review: Summary and Evaluation. USFWS New England Field Office. April 2013.

McLain, D.C., M.R. Ross. 2005. Reproduction based on local patch size of *Alasmidonta heterodon* and dispersal by its darter host in the Mill River, Massachusetts, USA. J. N. Am. Benthol. Soc. 24:139-147.

known and expected distribution of dwarf wedgemussel, it is extremely unlikely that individuals are currently present in the action area. EPA has not considered this species further in this assessment. Having said that, the middle Connecticut River may support habitat suitable for dwarf wedgemussel should the population recover. The Draft Permit includes limitations and conditions designed to protect water quality in the Connecticut, Chicopee, and Mill Rivers, and, as such, will ensure protection of physical habitat suitable for the dwarf wedgemussel.

It is EPA's preliminary determination that any effects resulting from the operation of this facility and the discharge from the CSO outfalls, as governed by the permit action, on shortnose sturgeon, Atlantic sturgeon, or designated critical habitat for Atlantic sturgeon will be insignificant. The reasoning to support this position is set forth in a letter seeking concurrence from NMFS regarding this determination, included as **Attachment J** to this Fact Sheet. Based on this analysis EPA has determined that the reissuance of the Springfield WWTF NPDES permit is not likely to adversely affect any listed species or critical habitat under USFWS' or NMFS' jurisdiction. During the public comment period, EPA has provided a copy of the draft permit and Fact Sheet to both NMFS and USFWS.

XIV. MONITORING

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), and 122.48

As noted on page 6 of the permit, a routine sampling program shall be developed in which samples are taken at the same location, same time and same day(s) of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable Discharge Monitoring Report (DMR) that is submitted to EPA.

The draft permit includes new provisions related to DMR submittals to EPA and the State. The draft permit requires that the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR. NetDMR is a national web-based tool for regulated CWA permittees to submit DMRs electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr. Further information about NetDMR, including contacts for EPA Region 1, is provided on this website. The permittee is currently submitting its DMRs using NetDMR.

All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR, unless otherwise specified in the permit. However, permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

XV. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless MassDEP certifies that the effluent limitations included in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards or it is determined that this certification is waived. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects the draft permit will be certified.

XVI. COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISIONS

All persons, including applicants, who believe any condition of the permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to U.S.EPA, Office of Ecosystem Protection, Att: Meridith Timony, Municipal Permits Unit (OEP06-1), 5 Post Office Square, Suite 100, Boston, MA 02109-3912 or to timony.meridith@epa.gov and to Claire Golden, Massachusetts Department of Environmental Protection, 205B Lowell Street, Wilmington, MA 01887 or to claire.golden@state.ma.us . Any person prior to such date may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after the public hearing, if held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and to each person who has submitted written comments or requested notice.

XVII. EPA and MassDEP CONTACTS

Requests for additional information or questions concerning the draft permit may be addressed Monday through Friday, between the hours of 9:00 a.m. and 5:00 p.m., to:

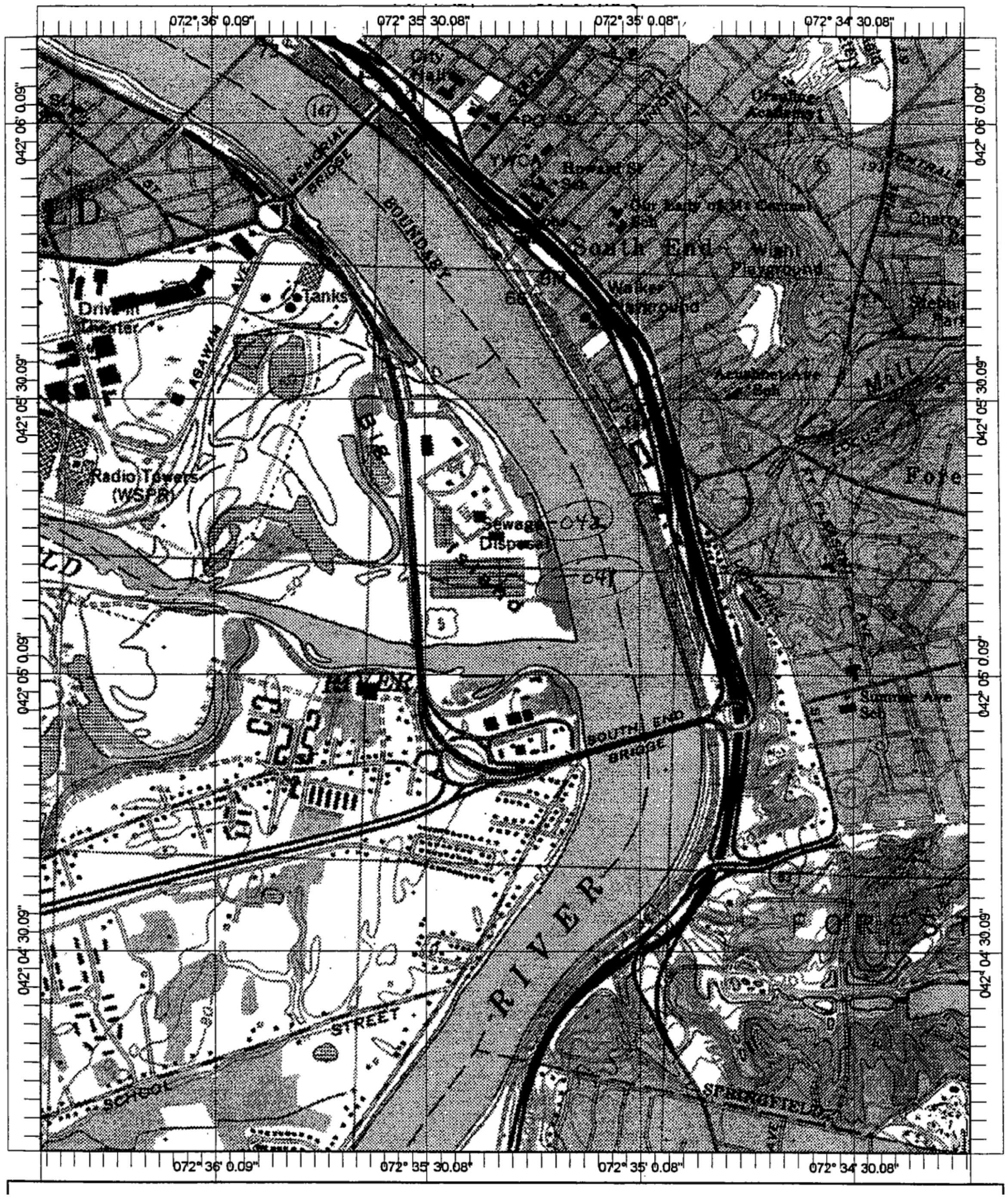
Meridith Timony
U.S. Environmental Protection Agency
Office of Ecosystem Protection (OEP06-1)
5 Post Office Square, Suite 100
Boston, MA 02109 – 3912
Telephone: (617) 918-1533
Fax: (617) 918-0533
E-mail: timony.meridith@epa.gov

Claire A. Golden
Massachusetts Department of Environmental Protection
Bureau of Water Resources
205B Lowell Street
Wilmington, MA 01887
Telephone: 978-694-3244
Fax: (978) 694-3498
Email: claire.golden@state.ma.us

November 15, 2017
Date

Lynne A. Hamjian, Acting Director
U.S. Environmental Protection Agency
Office of Ecosystem Protection
U.S. Environmental Protection Agency

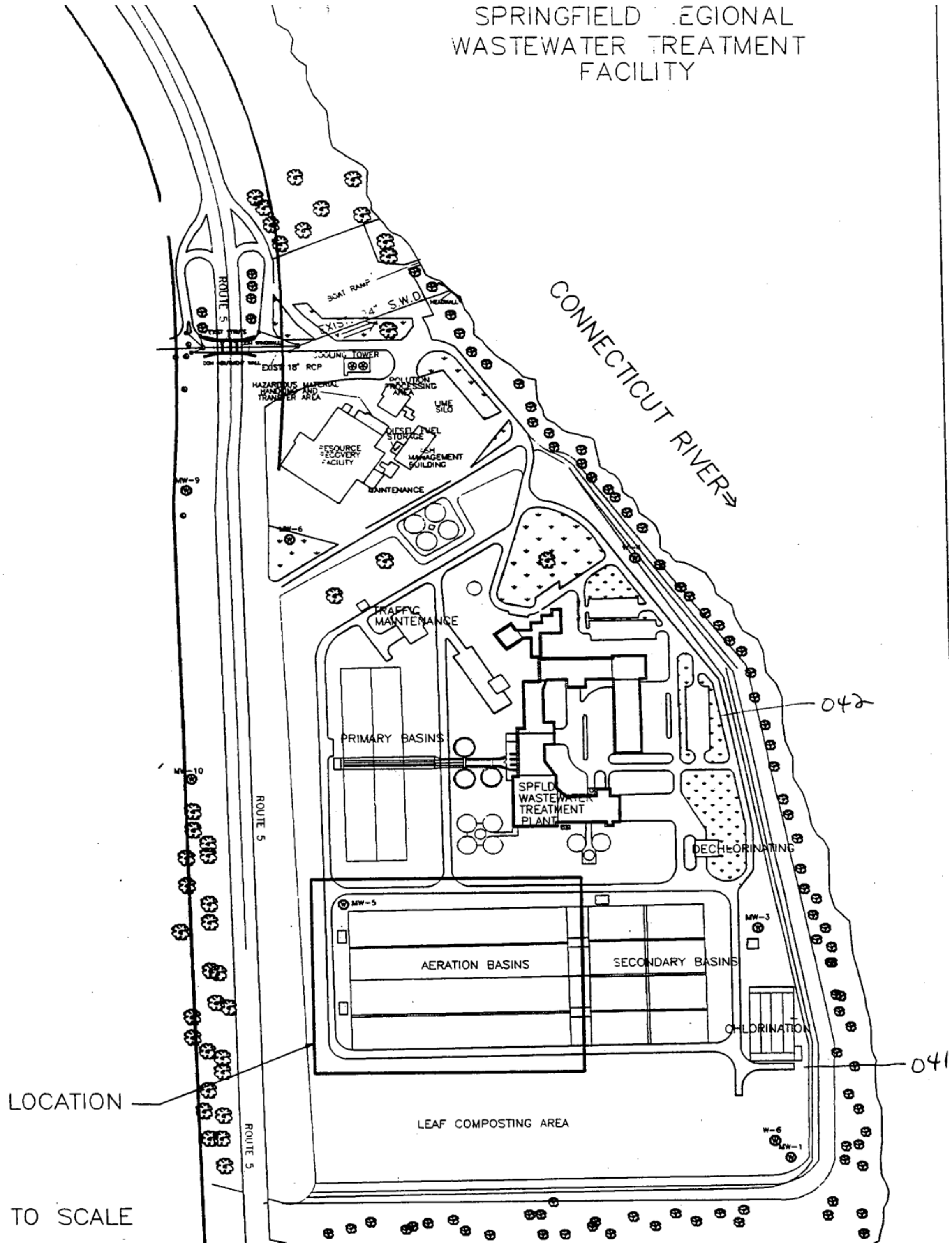
Attachment A
Site Location



Location of SRWTF, Outfall 001 (previously Outfall 041) and Outfall 042

EXHIBIT C

Attachment A
Site Location



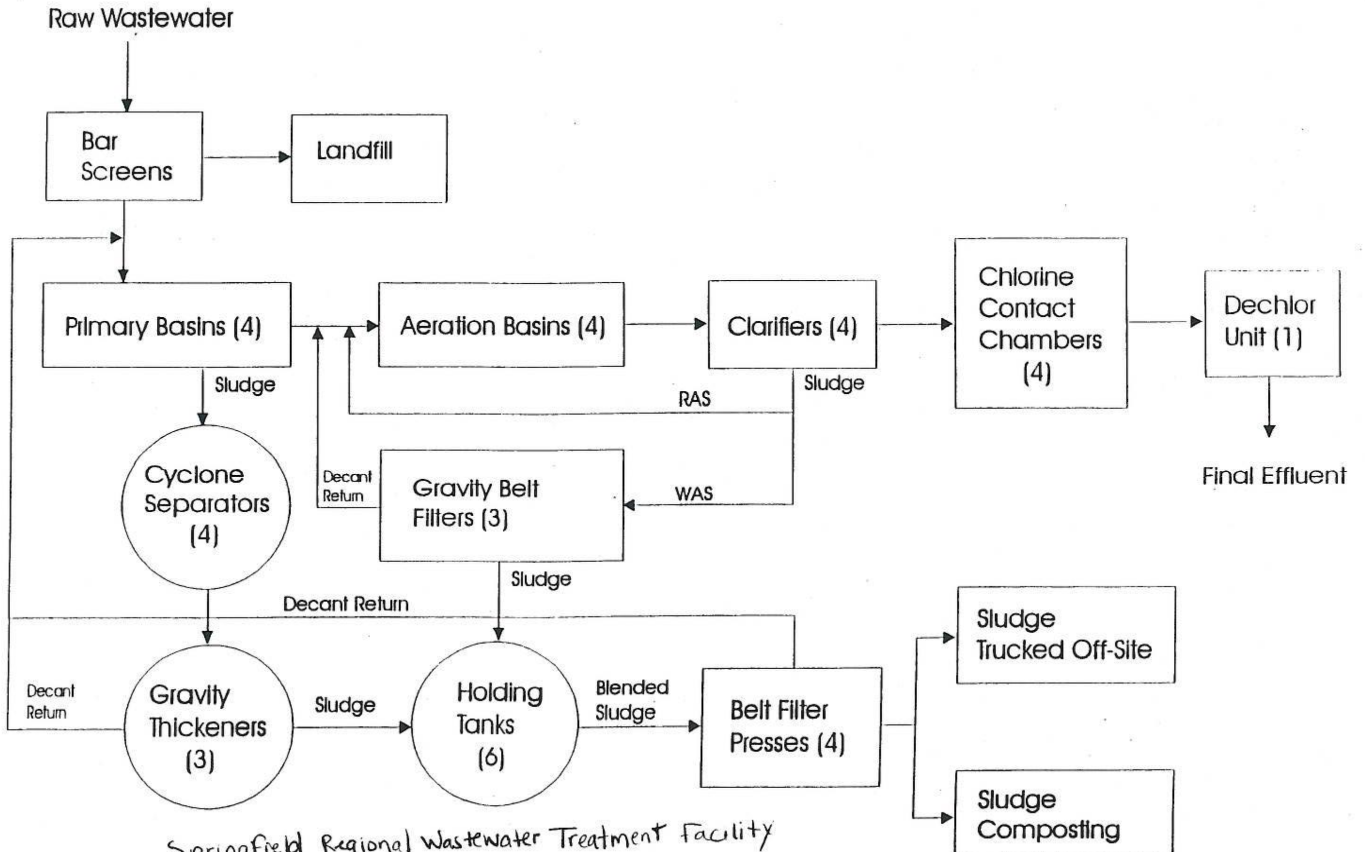
Location of SRWTF, Outfall 001 (previously Outfall 041) and Outfall 042

EXHIBIT C

Attachment B
Process Flow Diagram

Additional Information

SPRINGFIELD REGIONAL WASTEWATER TREATMENT FACILITY
PROCESS FLOW DIAGRAM



Springfield Regional Wastewater Treatment Facility
NPDES 0101613 Form 2A Question B3

EXHIBIT C

Attachment C

DMR Data

Effluent Data

Monitoring Period End Date	Flow		BOD_5						TSS					
	Daily Max	Monthly Average	Daily Max		Monthly Average		Weekly Average		Daily Max		Monthly Average		Weekly Average	
	MGD	MGD	mg/l	lbs/day	mg/l	lbs/day	mg/l	lbs/day	mg/l	lbs/day	mg/l	lbs/day	mg/l	lbs/day
31-Jan-11	35.6	37.5	8	2125	5	1316	6	1554	6	1612	4	1096	5	1214
28-Feb-11	74.8	37.3	47	29320	8	2911	12	5840	67	41797	8	3054	14	7230
31-Mar-11	123.1	38.1	84	51968	16	8860	28	25145	60	61599	15	8405	22	17760
30-Apr-11	86.7	38.4	100	47571	15	7347	25	12412	166	78968	18	8414	34	15942
31-May-11	74.7	39.3	54	28093	11	4801	17	8772	104	54106	12	5282	25	12650
30-Jun-11	65.5	40.4	42	21020	8	3589	13	5287	70	35034	10	4408	14	6338
31-Jul-11	48.8	41.1	6	2442	4	1208	5	1925	7	2812	4	1345	7	2632
31-Aug-11	100.8	42.1	7	3039	3	1144	3	1299	4	2521	3	1096	3	1146
30-Sep-11	106.3	43.8	55	28903	7	3212	13	6131	124	65162	10	5085	27	12947
31-Oct-11	76.4	44.9	33	21019	7	3288	9	4438	36	16560	6	2827	9	3675
30-Nov-11	88.3	46.1	49	23187	9	4149	11	5072	101	47794	10	4565	19	8648
31-Dec-11	89.5	47.4	74	34450	10	4553	15	6593	79	36778	7	3450	15	6553
31-Jan-12	65.5	48.5	68	34787	11	4626	22	9201	66	33764	10	4152	19	8287
29-Feb-12	50.6	48.7	56	23618	10	3435	15	5586	50	21088	7	2495	12	4389
31-Mar-12	51.1	47.2	13	4419	7	2445	9	3174	9	3838	5	1696	7	2363
30-Apr-12	61.6	46	19	8454	11	3546	15	4281	14	6962	7	2297	8	3235
31-May-12	54.5	45	10	2867	5	1509	7	2147	10	2867	4	1353	7	2091

EXHIBIT C

Attachment C

DMR Data

Effluent Data (Continued)

Monitoring Period End Date	Flow		BOD_5						TSS					
30-Jun-12	77.2	44.1	16	6924	6	1879	6	2271	19	8222	5	1676	6	2246
31-Jul-12	53.7	43.6	37	16565	5	1678	9	3402	29	12983	5	1398	8	2851
31-Aug-12	59	43	43	13689	9	2878	19	6611	55	23809	9	3303	23	8594
30-Sep-12	63.7	41.4	20	7081	5	1556	7	2060	17	6019	4	1217	6	1781
31-Oct-12	54.5	40.2	80	36389	11	3793	26	9759	80	36389	7	2500	18	7264
30-Nov-12	38	38.6	23	6503	8	2306	10	2923	6	1641	4	1164	5	1324
31-Dec-12	51.6	37	99	31441	12	3723	27	9361	153	48591	12	3884	37	12974
31-Jan-13	55.8	36.1	80	37236	17	5274	18	5369	58	21411	9	2885	10	3000
28-Feb-13	61.7	35.7	67	21407	14	4289	29	10563	62	18522	11	3518	19	6708
31-Mar-13	58.3	35.7	128	62215	9	3560	22	9952	201	97697	10	4352	31	14792
30-Apr-13	46.9	35.6	64	25023	7	2410	13	4833	67	26196	6	2060	13	4650
31-May-13	65.1	35.7	108	54295	14	5514	29	13440	163	81946	14	6252	37	18055
30-Jun-13	88	37	28	18749	8	3776	10	5835	17	11384	6	2974	12	6001
31-Jul-13	71	37.8	23	13610	8	2879	11	4484	14	8284	4	1731	6	2299
31-Aug-13	75.3	38	36	21355	14	4672	18	5607	24	11934	7	2468	10	3080
30-Sep-13	53.2	38.1	38	14334	10	3127	13	3810	48	18106	7	2356	11	3894
31-Oct-13	47.7	37.9	33	9523	10	2823	21	5730	24	6441	9	2552	16	4509
30-Nov-13	85.8	37.9	12	7158	7	1999	9	2383	14	5727	7	2012	10	2484
31-Dec-13	60.9	37.9	46	23356	10	3105	10	2778	29	14724	7	2318	7	2394
31-Jan-14	78.4	38.5	18	10923	9	3271	13	5184	14	8995	6	2176	9	3496
28-Feb-14	51	38.5	19	8121	10	3021	13	4115	12	5129	5	1551	7	2376
31-Mar-14	88.9	38.7	74	34579	14	5565	19	7738	45	21028	8	3072	11	4381

EXHIBIT C

Attachment C

DMR Data

Effluent Data (Continued)

Monitoring Period End Date	Flow		BOD_5						TSS					
30-Apr-14	78.2	40	137	81980	14	6866	14	8245	202	120876	14	7248	11	4795
31-May-14	94.9	41	74	37184	12	5539	31	17906	128	64318	10	4783	36	21077
30-Jun-14	57.8	39.9	14	5376	6	2012	7	2411	9	3456	5	1618	6	2028
31-Jul-14	55.1	39.6	25	8882	8	2744	10	3346	46	16343	8	2648	13	4267
31-Aug-14	77.9	39.4	9	3241	5	1535	6	2030	10	3896	5	1421	5	1797
30-Sep-14	40.4	39.2	10	2981	5	1316	8	2412	6	2022	4	987	4	1307
31-Oct-14	62.5	39.4	20	8228	4	1439	7	2166	25	10285	4	1434	8	2643
30-Nov-14	56.6	39.5	10	4722	4	1240	6	1736	6	2833	3	784	3	1010
31-Dec-14	83.8	40	15	9787	7	2610	8	3374	9	6292	5	1647	5	2133
31-Jan-15	76.2	39.7	19	12076	8	2699	9	3830	14	8898	5	1656	7	2745
28-Feb-15	32.8	39.4	15	3968	9	2438	10	2767	6	1616	5	1310	6	1478
31-Mar-15	58	39.3	61	29481	15	5661	22	9713	93	44947	15	5873	29	13137
30-Apr-15	59.5	38.8	104	47028	13	5201	21	9105	125	56524	13	5294	21	9460
31-May-15	41.4	37.4	80	27609	13	3859	13	3645	77	26573	9	2822	9	2440
30-Jun-15	72.7	37.4	92	42047	15	5908	33	13479	146	66727	18	7848	40	17406
31-Jul-15	49.3	37.1	19	6668	9	2673	12	4560	19	6668	8	2273	12	5512
31-Aug-15	46.4	36.7	63	24364	6	1765	13	4558	67	25911	6	1850	13	4698
30-Sep-15	64.3	36.6	9	3607	4	1160	5	1420	7	2806	4	1076	4	1188

EXHIBIT C

Attachment C

DMR Data

Effluent Data (Continued)

Monitoring Period End Date	Flow		BOD_5						TSS					
31-Oct-15	51.4	36.2	9	3364	5	1221	5	1493	7	1869	4	935	4	1105
30-Nov-15	45.1	35.8	11	4136	5	1252	6	1664	8	3008	4	897	5	1165
Existing Permit Limit	Report	67	Report	Reprt	30	16,763	45	25,145	Report	Reprt	30	16,763	45	25,145
Minimim	32.8	35.6	6	2125	3	1144	3	1299	4	1612	3	784	3	1010
Maximum	123.1	48.7	137	81980	17	8860	33	25145	202	120876	18	8414	40	21077
Average	65.1	40	44	20585	9.0	3291	14	5711	53	25158	7.6	2930	14	5723
Standard Deviation	18.4	3.42	33.9	17262	3.6	1704	7.5	4378	53	27100	3.7	1931	9.8	5119
No. Measurements	59	59	59	59	59	59	59	59	59	59	59	59	59	59

EXHIBIT C

Attachment C

DMR Data

Effluent Data (Continued)

Monitoring Period End Date	Chlorine, total residual			Coliform, fecal general		pH	
	Daily Max	Monthly Average	Weekly Average	Daily Max	Monthly Geo Mean	Max	Min
	mg/l	mg/l	mg/l	CFU/100ml	CFU/100ml	Standard Units	Standard Units
31-Jan-11						7.2	7
28-Feb-11						7.2	6.9
31-Mar-11						7.2	6.8
30-Apr-11	0.81	0.06	0.17	20	1	7.2	6.9
31-May-11	0.18	0.02	0.05	160	2	7.2	6.8
30-Jun-11	0.46	0.06	0.14	20	2	7.1	6.9
31-Jul-11	0.83	0.05	0.21	23	3	7.2	6.7
31-Aug-11	0.78	0.08	0.09	35	2	7.2	6.5
30-Sep-11	0.47	0.11	0.22	36	3	7.3	6.7
31-Oct-11	0.4	0.09	0.18	28	2	7.3	6.6
30-Nov-11						7.2	6.9
31-Dec-11						7.3	6.8
31-Jan-12						7.4	7
29-Feb-12						7.3	7
31-Mar-12						7.2	6.9
30-Apr-12	0	0	0	5	1	7.2	6.7
31-May-12	0.12	0.01	0.02	4	1	7.1	6.7
30-Jun-12	0.53	0.03	0.11	11	3	7.2	6.9

EXHIBIT C

Attachment C

DMR Data

Effluent Data (Continued)

Monitoring Period End Date	Chlorine, total residual			Coliform, fecal general		pH	
31-Jul-12	0.04	0	0.01	10	2	7.3	7
31-Aug-12	1.85	0.08	0.37	106	4	7.3	6.9
30-Sep-12	0.62	0.04	0.12	14	2	7.3	7
31-Oct-12	0.61	0.03	0.15	2	1	7.3	7
30-Nov-12						7.4	7.1
31-Dec-12						7.4	6.9
31-Jan-13						7.4	7
28-Feb-13						7.3	7
31-Mar-13						7.3	6.9
30-Apr-13	0.1	0	0	5	1	7.1	6.8
31-May-13	0.19	0.01	0.04	38	2	7.3	6.7
30-Jun-13	0.51	0.06	0.16	6	2	7.1	6.7
31-Jul-13	0.42	0.03	0.11	12	2	7.3	6.9
31-Aug-13	0.17	0.01	0.03	13	2	7.4	7.1
30-Sep-13	0.12	0.01	0.02	20	1	7.4	7
31-Oct-13	0	0	0	10	10	7.3	7
30-Nov-13						7.3	6.9
31-Dec-13						7.2	6.9
31-Jan-14						7.2	6.8
28-Feb-14						7.3	7
31-Mar-14						7.3	6.8
30-Apr-14	0.22	0.03	0.07	7	2	7.2	6.7

EXHIBIT C

Attachment C

DMR Data

Effluent Data (Continued)

Monitoring Period End Date	Chlorine, total residual			Coliform, fecal general		pH	
31-May-14	0.51	0.02	0.1	5	1	7.2	6.6
30-Jun-14	0.39	0.04	0.12	8	2	7.2	6.9
31-Jul-14	0.22	0.03	0.08	36	2	7.3	6.9
31-Aug-14	0.4	0.04	0.08	12	2	7.2	6.9
30-Sep-14	0.14	0.01	0.03	6	1	7.2	6.8
31-Oct-14	0.41	0.03	0.08	70	2	7.4	6.9
30-Nov-14						7.4	7
31-Dec-14						7.2	6.8
31-Jan-15						7.3	6.8
28-Feb-15						7.3	7.1
31-Mar-15						7.3	7
30-Apr-15	0.32	0.05	0.06	1	1	7.2	6.8
31-May-15	0.12	0.01	0.12	5	1	7.3	6.9
30-Jun-15	0.12	0.01	0.02	4200	3	7.3	7
31-Jul-15	0.13	0.01	0.03	184	2	7.3	7.1
31-Aug-15	0.37	0.02	0.07	110	2	7.3	7.1
30-Sep-15	0.22	0.01	0	17	2	7.3	6.9
31-Oct-15	0	0	0.04	6	2	7.3	7

Attachment C

DMR Data

Effluent Data (Continued)

Monitoring Period End Date	**Chlorine, total residual**			**Coliform, fecal general**		**pH**	
30-Nov-15						7.4	7
Existing Permit Limit	Report	0.22	0.38	400	200	6.5	8.3
Minimim	0	0	0	1	1	6.5	6.5
Maximum	1.9	0.11	0.37	4200	10	7.4	7.1
Average	0.37	0.03	0.09	150	2	7.3	6.9
Standard Deviation	0.35	0.03	0.08	706	2	0.1	0.1
No. Measurements	35	35	35	35	35	59	59

EXHIBIT C

Attachment C

DMR Data

Influent Data

	Raw Sewage Influent			
Monitoring Period End Date	**BOD_5**		**TSS**	
	Monthly Average	Monthly Average	Monthly Average	Monthly Average
	mg/l	lbs/day	mg/l	lbs/day
31-Jan-11	295	78171	289	77289
28-Feb-11	261	79122	265	82259
31-Mar-11	138	62897	140	64730
30-Apr-11	153	64228	145	61261
31-May-11	161	66746	156	65322
30-Jun-11	166	67486	165	67980
31-Jul-11	210	71240	185	63136
31-Aug-11	195	67290	174	61612
30-Sep-11	161	69451	147	63477
31-Oct-11	147	62035	135	56771
30-Nov-11	158	67765	134	57479
31-Dec-11	143	62519	139	62648
31-Jan-12	170	62783	142	52538
29-Feb-12	191	62336	160	52307
31-Mar-12	195	65193	161	53938
30-Apr-12	221	67944	172	53209
31-May-12	212	67415	179	57285
30-Jun-12	209	66398	165	52915
31-Jul-12	231	64594	189	53046
31-Aug-12	231	68637	202	61006
30-Sep-12	212	61057	170	48955
31-Oct-12	224	65748	171	50305
30-Nov-12	239	65237	179	48897
31-Dec-12	246	68938	186	52505
31-Jan-13	240	67343	201	56736
28-Feb-13	217	62517	154	44862
31-Mar-13	189	62802	151	50572
30-Apr-13	211	63422	180	54204
31-May-13	240	76493	194	64182

EXHIBIT C

Attachment C

DMR Data

Influent Data

	Raw Sewage Influent			
Monitoring Period End Date	**BOD_5**		**TSS**	
	Monthly Average	Monthly Average	Monthly Average	Monthly Average
	mg/l	lbs/day	mg/l	lbs/day
30-Jun-13	166	72114	152	67066
31-Jul-13	181	64651	163	59143
31-Aug-13	223	71381	204	65868
30-Sep-13	197	57590	184	54328
31-Oct-13	234	63577	200	54685
30-Nov-13	256	68805	213	58129
31-Dec-13	248	71716	200	58228
31-Jan-14	295	97318	199	66190
28-Feb-14	242	70425	206	60267
31-Mar-14	230	77256	178	61271
30-Apr-14	178	76087	152	65508
31-May-14	211	89531	168	71500
30-Jun-14	240	80807	185	62719
31-Jul-14	235	77340	192	64004
31-Aug-14	250	74736	205	62941
30-Sep-14	257	70770	232	64678
31-Oct-14	252	73911	196	57862
30-Nov-14	290	81553	215	61349
31-Dec-14	264	89400	163	55961
31-Jan-15	322	97909	185	56990
28-Feb-15	271	71564	189	49853
31-Mar-15	235	77303	176	58662

EXHIBIT C

Attachment C

DMR Data

Influent Data

	Raw Sewage Influent			
Monitoring Period End Date	**BOD$_5$**		**TSS**	
	Monthly Average	Monthly Average	Monthly Average	Monthly Average
	mg/l	lbs/day	mg/l	lbs/day
30-Apr-15	185	69857	148	55957
31-May-15	286	84861	206	61128
30-Jun-15	254	84078	202	67846
31-Jul-15	268	77434	209	60853
31-Aug-15	272	71945	229	60853
30-Sep-15	254	64035	211	54921
31-Oct-15	274	70745	222	57051
30-Nov-15	281	66756	214	50686
Existing Permit Limit	Report	Report	Report	Report
Minimim	138	57590	134	44862
Maximum	322	97909	289	82259
Average	224	71242	184	59287
Standard Deviation	43.4	8645	30.7	6893
No. Measurements	59	59	59	59
No. Exceedances				

EXHIBIT C

Attachment D

CSO Outfalls Locations and Volumes

Outfall No.	Location	Latitude Longitude
To Connecticut River		
007	Rowland St.	42º 12’ 72º 62’
008	Washburn St. 4	42º 11’ 72º 62’
010	Clinton St.	42º 10’ 72º 60’
011	Liberty St.	42º 10’ 72º 59’
012	Worthington St.	42º 10’ 72º 59’
013	Bridge St.	42º 10’ 72º 59’
014	Elm St.	42º 10’ 72º 59’
015A	Union St.	42º 10’ 72º 59’
015B	Union St.	42º 10’ 72º 59’
016	York St.	42º 09’ 72º 59’
018	Longhill St.	42º 06’ 72º 58’
049	Springfield St.	42º 10’ 72º 62’
042	Bondi Island Treatment Plant	
To Mill River		
017	Fort Pleasant (Blake Hill)	42º 09’ 72º 58’
019	Mill, Orange, & Locust Sts.	42º 09’ 72º 57’
024	Rifle & Central Sts.	42º 10’ 72º 56’
025	Allen & Oakland Sts.	42º 10’ 72º 56’
045	Fort Pleasant Ave.	42º 06’ 72º 58’
046	Belmont St.	42º 06’ 72º 58’
048	Allen & Rifle Sts.	42º 10’ 72º 56’
To Chicopee River		
034	Main St.	42º 16’ 72º 51’
035	Front & Oak Sts.	42º 16’ 72º 50’
036A	Pinevale & Water Sts.	42º 16’ 72º 50’
037	Cedar St. 4	42º 16’ 72º 50’

EXHIBIT C

Attachment D

CSO overflow events, and volume (in 1,000's of gallons), as reported by SWSC

	2012		2013		2014		2015		2016	
Outfall	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume
7	2	0.3	1	83	2	941	6	550	3	450,773
8	37	65,573	7	20,903	0	0	11	14,446	2	380,020
10	32	43,179	37	74,458	47	77,494	34	48,446	36	34,047,622
11	41	86,026	4	68	4	475	1	0	4	208783
12	34	46,730	47	194,448	53	143,896	32	94,150	17	44,169,891
13	17	9,784	26	12,852	53	18,302	39	5,316	19	13,062,740
14	22	4,573	38	16,018	35	10,215	38	15,568	39	9,357,306
015A	42	9986	31	11,302	27	11,966	26	5,828	18	4,874,542
015B	0	0	9	379	11	844	6	83	1	3136
16	33	53,783	35	85,782	40	74,421	23	21,727	32	40,031,958
18	12	756	16	768	14	735	15	317	7	455784
49	13	1,639	15	1,873	25	2,486	24	4,104	11	482,649
17	13	1,635	22	1,779	18	2,616	17	1,404	7	67,851
19	17	18,650	7	8,258	9	2,150	4	8,857	3	1,142,252
24	9	448	7	1,258	9	392	7	254	1	21,126
25	11	1,241	18	2,231	18	1,342	10	534	13	1,377,830
45	15	268	24	696	19	1,545	12	670	6	1,491
46	20	1,813	23	2,425	18	3,316	10	1,293	6	618,669
48	10	4,957	12	530	16	1,319	15	6,355	11	439,059
34	14	1,648	21	4,848	21	1,278	12	841	10	61,447
35	22	2,146	11	1,754	11	2,462	10	726	5	337,987
37A	22	461	9	1,342	10	601	8	392	12	226,657
36A	24	3,680	14	3,160	17	3,485	14	2,310	5	1,327,395
042 at WWTF	10	5,532	11	4,307	16	16,313	12	6,878	8	6,435,000
CSO Total	472	361,510	445	451,522	493	378,594	386	241,049	276	159,581,968
WWTF Bypass	19	41,285	30	91,875	31	121,040	19	51,562	1	6,771,000

Attachment D

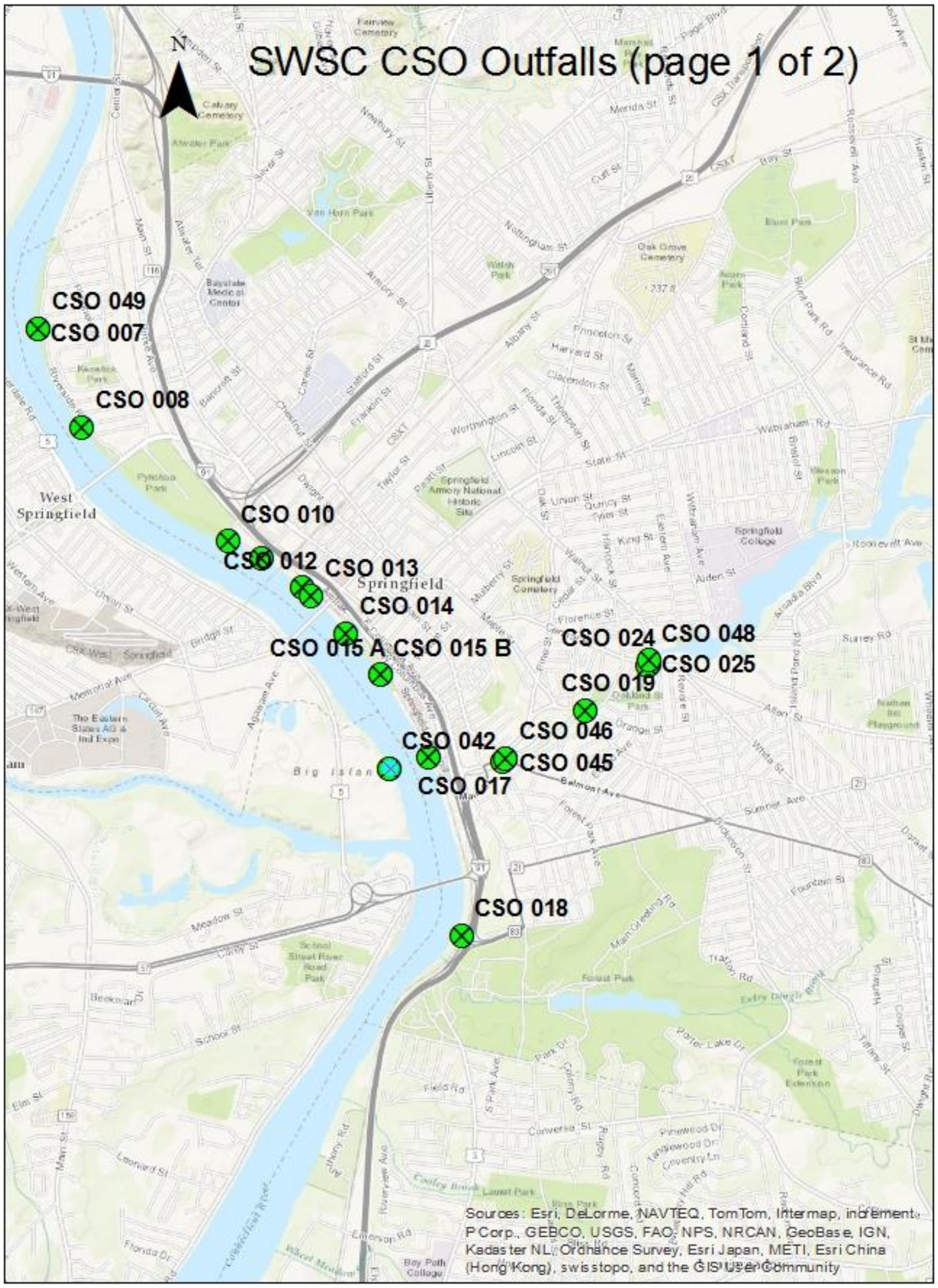
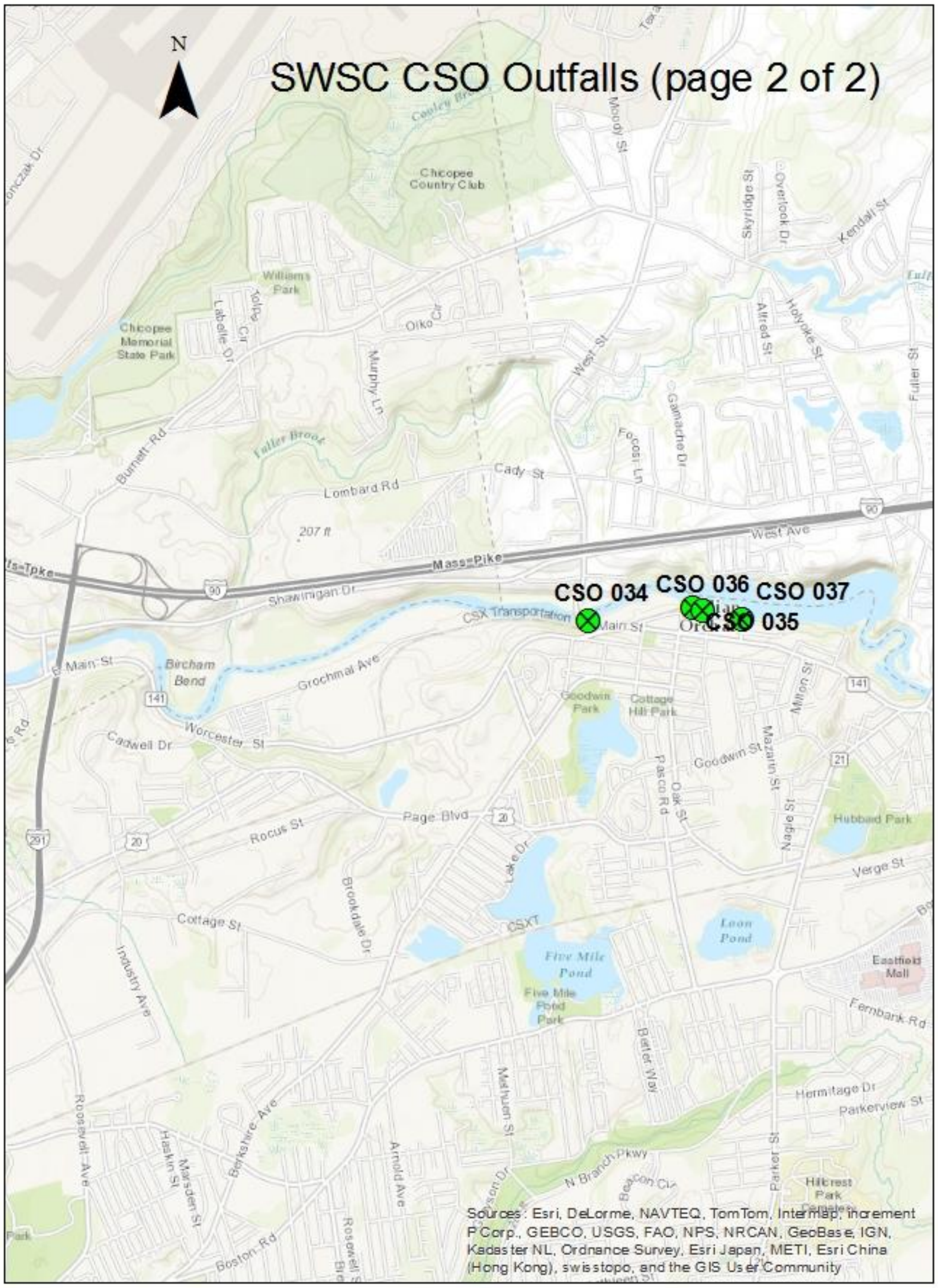


EXHIBIT C

Attachment D



Attachment E
Metals Data

Effluent Data as Reported in WET Tests (all values are mg/l)

Date	Hardness	Aluminum	Copper	Cadmium	Chromium	Nickel	Lead	Zinc
6/8/2010	94.98	0.02	0.0106	0	0	0.009	0	0.0552
9/14/2010	114	0	0.0075	0	0	0.0046	0	0.0417
3/8/2011	78	0.13	0.0337	0	0	0.034	0	0.0595
6/7/2011	116.5	0	0.0066	0	0	0.045	0	0.0307
9/13/2011	94.94	0	0.0835	0	0	0.077	0	0.0655
3/7/2012	79.3	0.1	0.0913	0	0.019	0.056	0	0.0517
6/5/2012	88.55	0	0.0083	0	0	0.036	0	0.0465
9/11/2012	67.86	0.03	0.0091	0	0	0.022	0	0.0645
12/4/2012	71.6	0	0.0062	0	0	0.019	0	0.0376
3/6/2013	93.1	0	0.0051	0	0	0.019	0.008	0.0531
6/4/2013	58.51	0	0	0	0	0.046	0.006	0.0417
12/9/2013	79.49	0	0.0083	0	0	0.011	0	0.0446
3/4/2014	97.19	0.02	0.0342	0	0	0.016	0	0.0573
6/10/2014	87.47	0.02	0.0104	0	0	0.01	0	0.0543
9/9/2014	81.41	0.13	0.0354	0	0	0.007	0	0.0683
12/16/2014	99.61	0	0.0043	0	0	0.011	0	0.055
3/25/2015	102.5	0	0.0073	0	0	0.008	0	0.0516
6/9/2015	99.88	0	0.0258	0	0	0.011	0	0.0563
Median	**90.825**	**0**	**0.0087**	**0**	**0**	**0.0175**	**0**	**0.0537**

EXHIBIT C

Attachment E
Metals Data

Ambient Data as Reported in WET Tests (all values are mg/l)

Date	Hardness	Aluminum	Copper	Nickel	Lead	Zinc	Ammonia	pH
6/8/2010	50.02	0.06	0.006	0.004	0	0.0143	0.1	7.04
9/14/2010	79.87	0.16	0.0063	0	0	0.0162	0	6.95
3/8/2011	27.4	0.40	0.0145	0.022	0	0.0128	0	6.94
6/7/2011	44.58	0.14	0.0365	0.049	0	0.0136	0.11	6.8
9/13/2011	32.02	0.88	0.1075	0.072	0.008	0.0343	0.35	7.05
3/7/2012	51.32	0.11	0.0435	0.026	0	0.0162	1.37	6.91
6/5/2012	31.75	0.48	0.0205	0.069	0.007	0.0201	0.11	6.79
9/11/2012	51.82	0.12	0.0084	0.028	0.011	0.0228	0	7.01
12/4/2012	40.9	0.08	0.0147	0.042	0	0.0191	0.31	6.58
3/6/2013	45.05	0.16	0.0031	0.014	0	0.0242	2.3	6.75
6/4/2013	20.95	0.02	0.0061	0	0	0.0038	0.18	6.86
12/9/2013	37.45	0.17	0.0144	0.005	0	0.0193	0.3	7.02
3/4/2014	36.61	0.08	0.0212	0.005	0	0.0104	0.1	6.95
6/10/2014	46.68	0.79	0.0063	0.004	0	0.0182	0.97	6.39
9/9/2014	53.45	0.09	0.0192	0	0	0.0071	0.13	6.86
12/16/2014	28.66	0.10	0.0033	0	0	0.0096	0.12	6.79
3/25/2015	46.12	0.07	0.0049	0.005	0	0.0096	0.17	6.63
6/9/2015	35.96	0.18	0.0244	0.006	0	0.0178	0.17	6.88
Median	**42.74**	**0.13**	**0.01445**	**0.0055**	**0**	**0.0162**	**0.15**	**6.87**

Statistical Approach to Characterizing the Effluent for Determining Reasonable Potential

EPA bases its determination of "reasonable potential" on a characterization of the upper bound of expected effluent concentrations based on a statistical analysis of the available monitoring data. As noted in the *Technical Support Document for Water Quality Based Toxics Control* (EPA 1991) ("TSD"), "[a]ll monitoring data, including results for concentrations of individual chemicals, have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty." Thus with a limited data set, the maximum concentration that has been found in the samples may not reflect the full range of effluent concentration.

To account for this, EPA has developed a statistical approach to characterizing effluent variability when the monitoring dataset includes 10 or more samples.[1] As "experience has shown that daily pollutant discharges are generally lognormally distributed," *TSD* at App. E, EPA uses a lognormal distribution to model the shape of the observed data, unless analysis indicates a different distributional model provides a better fit to the data. The model parameters (mean and variance) are derived from the monitoring data. The model parameter μ is the mean of the natural logs of the monitoring data values, while σ is the standard deviation of the natural logs of the monitoring data values.

The lognormal distribution generally provides a good fit to environmental data because it is bounded on the lower end (i.e. you cannot have pollutant concentrations less than zero) and is positively skewed. It also has the practical benefit that if an original lognormal data set X is logarithmically transformed (i.e. Y = ln[X]) the resulting variable Y will be normally distributed. Then the upper percentile expected values of X can be calculated using the z-score of the standardized normal distribution (i.e. the normal distribution with mean = 0 and variance = 1), a common and relatively simple statistical calculation. The p^{th} percentile of X is estimated by

$$X_p = \exp(\mu_y + z_p \times \sigma_y),$$

where μ_y = mean of Y
σ_y = standard deviation of Y
$Y = \ln[X]$
z_p = the z-score for percentile "p"

For the 95^{th} percentile, $z_{95} = 1.645$, so that

$$X_{95} = \exp(\mu_y + 1.645 \times \sigma_y)$$

The 95th percentile value is used to determine whether a discharge has a reasonable potential to cause or contribute to an exceedance of a water quality standard. The combination of the upper bound effluent concentration with dilution in the receiving water is calculated to determine whether the water quality criteria will be exceeded.

[1] A different statistical approach is applied where the monitoring data set includes less than 10 samples.

Datasets including non-detect values

The *TSD* also includes a procedure for determine such percentiles when the dataset includes non-detect results, based on a delta-lognormal distribution. In the delta-lognormal procedures, nondetect values are weighted in proportion to their occurrence in the data. The values above the detection limit are assumed to be lognormally distributed values.

The statistical derivation of the delta-lognormal upper bounds is quite complex and is set forth in the TSD at Appendix E. Calculation of the 95^{th} percentile of the distribution, however, involves a relatively straightforward adjustment of the equations given above for the lognormal distribution, as follows.

For the deltalognormal, the pth percentile of X, referred to here as X_p*, is given by

$$X_p^* = \exp(\mu_y^* + z_p^* \times \sigma_y^*),$$

where μ*= mean of Y values for data points above the detection limit;
σ_y*= standard deviation of Y for data points above the detection limit;
Y = ln[X*];
X*= monitoring data above detection limit; and
z_p* = an adjusted z score that is given by the equation:

$$z_p^* = \text{z-score}[(p - \delta)/(1 - \delta)]$$

where δ is the proportion of nondetects in the monitoring dataset.

k = total number of dataset
r = number of nondetect values in the dataset
$\delta = r/k$

For the 95th percentile, this takes the form of $z_p^* = \text{z-score}[(.95 - \delta)/(1 - \delta)]$. The resulting values of z_p^* for various values of δ is set forth in the table below; the calculation is easily performed in excel or other spreadsheet programs.

Example calculations of z_p^* for 95th percentile

δ	**(0.95 - δ)/ (1 - δ)**	**z_p^***
0	0.95	1.645
0.1	0.94	1.593
0.3	0.93	1.465
0.5	0.90	1.282
0.7	0.83	0.967

EXHIBIT C

Attachment G
Out of Basin Point Source Loadings

Attachment G
NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
NEW HAMPSHIRE					
Bethlehem Village District	NH0100501	0.340	0.220	19.600	35.962
Charlestown WWTF	NH0100765	1.100	0.360	19.600	58.847
Claremont WWTF	NH0101257	3.890	1.610	14.060	188.789
Colebrook WWTF	NH0100315	0.450	0.230	19.600	37.597
Groveton WWTF	NH0100226	0.370	0.290	19.600	47.405
Hanover WWTF	NH0100099	2.300	1.440	30.000	360.288
Hinsdale WWTF	NH0100382	0.300	0.300	19.600	49.039
Keene WWTF	NH0100790	6.000	3.910	12.700	414.139
Lancaster POTW	NH0100145	1.200	1.080	8.860	79.804
Lebanon WWTF	NH0100366	3.180	1.980	19.060	314.742
Lisbon WWTF	NH0100421	0.320	0.146	19.600	23.866
Littleton WWTF	NH0100153	1.500	0.880	10.060	73.832
Newport WWTF	NH0100200	1.300	0.700	19.600	114.425
Northumberland Village WPCF	NH0101206	0.060	0.060	19.600	9.808
Sunapee WPCF	NH0100544	0.640	0.380	15.500	49.123
Swanzey WWTP	NH0101150	0.167	0.090	19.600	14.712
Troy WWTF	NH0101052	0.265	0.060	19.600	9.808
Wasau Paper (industrial facility)	NH0001562		5.300	4.400	194.489

EXHIBIT C

Attachment G
Out of Basin Point Source Loadings

Whitefield WWTF	NH0100510	0.185	0.140	19.600	22.885
Winchester WWTP	NH0100404	0.280	0.240	19.600	39.231
Woodsville Fire District	NH0100978	0.330	0.230	16.060	30.806
New Hampshire Total		**24.177**	**19.646**		**2169.596**

VERMONT					
Bellows Falls	VT0100013	1.405	0.610	21.060	107.141
Bethel	VT0100048	0.125	0.120	19.600	19.616
Bradford	VT0100803	0.145	0.140	19.600	22.885
Brattleboro	VT0100064	3.005	1.640	20.060	274.373
Bridgewater	VT0100846	0.045	0.040	19.600	6.539
Canaan	VT0100625	0.185	0.180	19.600	29.424
Cavendish	VT0100862	0.155	0.150	19.600	24.520
Chelsea	VT0100943	0.065	0.060	19.600	9.808
Chester	VT0100081	0.185	0.180	19.600	29.424
Danville	VT0100633	0.065	0.060	19.600	9.808
Lunenberg	VT0101061	0.085	0.080	19.600	13.077
Hartford	VT0100978	0.305	0.300	19.600	49.039
Ludlow	VT0100145	0.705	0.360	15.500	46.537
Lyndon	VT0100595	0.755	0.750	19.600	122.598
Putney	VT0100277	0.085	0.080	19.600	13.077
Randolph	VT0100285	0.405	0.400	19.600	65.386
Readsboro	VT0100731	0.755	0.750	19.600	122.598
Royalton	VT0100854	0.075	0.070	19.600	11.442
St. Johnsbury	VT0100579	1.600	1.140	12.060	114.662

EXHIBIT C

Attachment G
Out of Basin Point Source Loadings

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
Saxtons River	VT0100609	0.105	0.100	19.600	16.346
Sherburne Fire Dist.	VT0101141	0.305	0.300	19.600	49.039
Woodstock WWTP	VT0100749	0.055	0.050	19.600	8.173
Springfield	VT0100374	2.200	1.250	12.060	125.726
Hartford	VT0101010	1.225	0.970	30.060	243.179
Whitingham	VT0101109	0.015	0.010	19.600	1.635
Whitingham Jacksonville	VT0101044	0.055	0.050	19.600	8.173
Cold Brook Fire Dist.	VT0101214	0.055	0.050	19.600	8.173
Wilmington	VT0100706	0.145	0.140	19.600	22.885
Windsor	VT0100919	1.135	0.450	19.600	73.559
Windsor-Weston	VT0100447	0.025	0.020	19.600	3.269
Woodstock WTP	VT0100757	0.455	0.450	19.600	73.559
Woodstock-Taftsville	VT0100765	0.015	0.010	19.600	1.635
Vermont Totals		**15.940**	**10.960**		**1727.302**

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					

EXHIBIT C

Attachment G

Out of Basin Point Source Loadings

Amherst	MA0100218	7.100	4.280	14.100	503.302
Athol	MA0100005	1.750	1.390	17.200	199.393
Barre	MA0103152	0.300	0.290	26.400	63.851
Belchertown	MA0102148	1.000	0.410	12.700	43.426
Charlemont	MA0103101	0.050	0.030	19.600	4.904
Chicopee	MA0101508	15.500	10.000	19.400	1617.960
Easthampton	MA0101478	3.800	3.020	19.600	493.661
Erving #1	MA0101516	1.020	0.320	29.300	78.196
Erving #2	MA0101052	2.700	1.800	3.200	48.038
Erving #3	MA0102776	0.010	0.010	19.600	1.635
Gardner	MA0100994	5.000	3.700	14.600	450.527
Greenfield	MA0101214	3.200	3.770	13.600	427.608
Hadley	MA0100099	0.540	0.320	25.900	69.122
Hardwick G	MA0100102	0.230	0.140	14.600	17.047
Hardwick W	MA0102431	0.040	0.010	12.300	1.026
Hatfield	MA0101290	0.500	0.220	15.600	28.623
Holyoke	MA0101630	17.500	9.700	8.600	695.723
Huntington	MA0101265	0.200	0.120	19.600	19.616
Monroe	MA0100188	0.020	0.010	19.600	1.635
Montague	MA0100137	1.830	1.600	12.900	172.138
N Brookfield	MA0101061	0.760	0.620	23.100	119.445
Northampton	MA0101818	8.600	4.400	22.100	810.982
Northfield	MA0100200	0.280	0.240	16.800	33.627
Northfield School	MA0032573	0.450	0.100	19.600	16.346
Old Deerfield	MA0101940	0.250	0.180	9.200	13.811
Orange	MA0101257	1.100	1.200	8.600	86.069
Palmer	MA0101168	5.600	2.400	18.800	376.301
Royalston	MA0100161	0.040	0.070	19.600	11.442
Russell	MA0100960	0.240	0.160	19.600	26.154
Shelburne Falls	MA0101044	0.250	0.220	16.900	31.008

EXHIBIT C

South Deerfield	MA0101648	0.850	0.700	7.900	46.120
South Hadley	MA0100455	4.200	3.300	28.800	792.634
Spencer	MA0100919	1.080	0.560	13.600	63.517
Springfield	MA0103331	67.000	45.400	4.300	1628.135
Sunderland	MA0101079	0.500	0.190	8.700	13.786
Templeton	MA0100340	2.800	0.400	26.400	88.070

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
Ware	MA0100889	1.000	0.740	9.400	58.013
Warren	MA0101567	1.500	0.530	14.100	62.325
Westfield	MA0101800	6.100	3.780	20.400	643.114
Winchendon	MA0100862	1.100	0.610	15.500	78.855
Woronoco Village	MA0103233	0.020	0.010	19.600	1.635
Massachusetts Totals		**166.010**	**106.950**		**9938.820**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is

assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.

4. Current total nitrogen load.

Total Nitrogen Load = 13,836 lbs/day
MA (41 facilities) = 9,939 lbs/day (72%)
VT (32 facilities) = 1,727 lbs/day (12%)
NH (21 facilities) = 2170 lbs/day (16%)
TMDL Baseline Load = 21,672 lbs/day

TMDL Allocation = 16,254 lbs/day (25% reduction)

MA Discharges to Housatonic River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
Crane	MA0000671		3.100	8.200	212.003
Great Barrington	MA0101524	3.200	2.600	17.000	368.628
Lee	MA0100153	1.000	0.870	14.500	105.209
Lenox	MA0100935	1.190	0.790	11.800	77.745
Mead Laurel Mill	MA0001716		1.500	6.400	80.064
Mead Willow Mill	MA0001848		1.100	4.600	42.200
Pittsfield	MA0101681	17.000	12.000	12.400	1240.992
Stockbridge	MA0101087	0.300	0.240	11.100	22.218
West Stockbridge	MA0103110	0.076	0.018	15.500	2.327
Massachusetts Totals			**22.218**	**101.500**	**2151.386**

EXHIBIT C

Attachment G
Out of Basin Point Source Loadings

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 2151.386 lbs/day

TMDL Baseline Load = 3,286 lbs/day
TMDL Allocation = 2,464 lbs/day (25% reduction)

MA Discharges to Thames River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					
Charlton	MA0101141	0.450	0.200	12.700	21.184
Leicester	MA0101796	0.350	0.290	15.500	37.488
Oxford	MA0100170	0.500	0.230	15.500	29.732
Southbridge	MA0100901	3.770	2.900	15.500	374.883
Sturbridge	MA0100421	0.750	0.600	10.400	52.042

EXHIBIT C

Attachment G
Out of Basin Point Source Loadings

Webster	MA0100439	6.000	3.440	17.400	499.199
Massachusetts Totals		**11.820**	**7.660**		**1014.528**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 1014.528 lbs/day

TMDL Baseline Load = 1,253 lbs/day

TMDL Allocation = 939 lbs/day (25% reduction)

EXHIBIT C

Attachment H

Nitrogen Data

Date	Rolling Annual Average Flow	Nitrite + Nitrate total [as N]	Nitrogen, Kjeldahl, total [as N]	Total Nitrogen	Total Nitrogen	Total Nitrogen (based on rolling annual average flow)
	Million Gallons per Day	mg/l	mg/l	mg/l	lbs/day	lbs/day
28-Feb-2001	36.9	3.1	2.24	5.34	1,638	1643
31-Mar-2001	48.7	1.84	2	3.84	1,554	1560
30-Apr-2001	56.33	2.26	1.9	4.16	1,948	1954
31-May-2001	44.7	2.35	1.65	4	1,486	1491
30-Jun-2001	42.3	1.74	1.12	2.86	1,006	1009
31-Jul-2001	41.57	2.94			0	0
31-Aug-2001	40.9	1.86	1.76	3.62	1,231	1235
30-Sep-2001	37.4	2.08	1.18	3.26	1,013	1017
31-Oct-2001	40.25	1.95	1.18	3.13	1,047	1051
30-Nov-2001	41.3	3.18	1.23	4.41	1,514	1519
31-Dec-2001	40.8	6.54	3.696	10.236	3,472	3483
31-Jan-2002	39.1	3.63	2.3	5.93	1,927	1934
28-Feb-2002	38.8	1.47	1.8	3.27	1,055	1058
31-Mar-2002	37.8	2.21	1.9	4.11	1,291	1296
30-Apr-2002	36.4	3.52	1	4.52	1,368	1372
31-May-2002	36.1	2.75	1.76	4.51	1,353	1358
30-Jun-2002	35.7	3.96	1.18	5.14	1,525	1530
31-Jul-2002	35.5	4.14	1.18	5.32	1,570	1575
31-Aug-2002	35.3	3.71	1.18	4.89	1,435	1440
30-Sep-2002	35.2	0.455	1.6	2.055	601	603
31-Oct-2002	35.2	3.93	1.26	5.19	1,519	1524
30-Nov-2002	35.9	2.06	1.23	3.29	982	985
31-Dec-2002	36.3	3	1.18	4.18	1,261	1265
31-Jan-2003	37.15	2.12	1.47	3.59	1,109	1112
28-Feb-2003	37.38	3.32	4.12	7.44	2,312	2319
31-Mar-2003	38.5	3.14	3.39	6.53	2,090	2097
30-Apr-2003	39.4	2.01	1.23	3.24	1,061	1065
31-May-2003	39.8	4.52	2.24	6.76	2,236	2244
30-Jun-2003	40.9	3.65	2.94	6.59	2,240	2248
31-Jul-2003	41.6	2.82	2.46	5.28	1,826	1832

EXHIBIT C

Attachment H

Nitrogen Data

Date	Rolling Annual Average Flow	Nitrite + Nitrate total [as N]	Nitrogen, Kjeldahl, total [as N]	Total Nitrogen	Total Nitrogen	Total Nitrogen (based on rolling annual average flow)
	Million Gallons per Day	mg/l	mg/l	mg/l	lbs/day	lbs/day
31-Aug-2003	42.2	3.25	1.18	4.43	1,554	1559
30-Sep-2003	40.1	2.17	1.18	3.35	1,117	1120
31-Oct-2003	44.1	0.357	2.06	2.417	886	889
30-Nov-2003	44.8	2.55	1.23	3.78	1,408	1412
31-Dec-2003	45.8	3.2	1.23	4.43	1,687	1692
31-Jan-2004	46.5	3.1	2.06	5.16	1,994	2001
29-Feb-2004	46.6	2.11	1.12	3.23	1,251	1255
31-Mar-2004	45.9	2.19	1.4	3.59	1,370	1374
30-Apr-2004	46.2	2.51	0	2.51	964	967
31-May-2004	46.5	3.11	0	3.11	1,202	1206
30-Jun-2004	45.6	2.93	1.18	4.11	1,558	1563
31-Jul-2004	45.4	3.23	1.76	4.99	1,883	1889
31-Aug-2004	45.3	4.13	0	4.13	1,555	1560
30-Sep-2004	45.2	4.4	1.12	5.52	2,074	2081
31-Oct-2004	44.5	4	0	4	1,480	1485
30-Nov-2004	43.7	4.87	1.96	6.83	2,481	2489
31-Dec-2004	43.4	3.06	0	3.06	1,104	1108
31-Jan-2005	43.2	3.06	1.47	4.53	1,627	1632
28-Feb-2005	49.9	0.988		0.988	410	411
31-Mar-2005	44.2	3.58	0	3.58	1,315	1320
30-Apr-2005	44.2	2.78	0	2.78	1,021	1025
31-May-2005	44	2.17	1.18	3.35	1,225	1229
30-Jun-2005	43.9	2.03	2.35	4.38	1,598	1604
31-Jul-2005	43.8	3.78	1.6	5.38	1,959	1965
31-Aug-2005	43.6	4.06	3.23	7.29	2,642	2651
30-Sep-2005	43.2	2.12	1.6	3.72	1,336	1340
31-Oct-2005	45.6	2.75	0	2.75	1,042	1046
30-Nov-2005	47	4.24	1.6	5.84	2,282	2289
31-Dec-2005	47.5	4.14	1.4	5.54	2,187	2195
31-Jan-2006	48.9	1.78	0	1.78	724	726

EXHIBIT C

Attachment H

Nitrogen Data

Date	Rolling Annual Average Flow	Nitrite + Nitrate total [as N]	Nitrogen, Kjeldahl, total [as N]	Total Nitrogen	Total Nitrogen	Total Nitrogen (based on rolling annual average flow)
	Million Gallons per Day	mg/l	mg/l	mg/l	lbs/day	lbs/day
28-Feb-2006	49.9	0.988		0.988	410	411
31-Mar-2006	49.7	1.95	1.76	3.71	1,533	1538
30-Apr-2006	48.4	2.79	1.4	4.19	1,686	1691
31-May-2006	48.7	1.57	2.52	4.09	1,656	1661
30-Jun-2006	49.8	1.64	2.94	4.58	1,896	1902
31-Jul-2006	50.6	1.18	2.65	3.83	1,611	1616
31-Aug-2006	51.1	3.07	2.52	5.59	2,374	2382
30-Sep-2006	51.3	2.22	5.54	7.76	3,309	3320
31-Oct-2006	49.2	2.82	0	2.82	1,153	1157
30-Nov-2006	48.4	0.118	3.08	3.198	1,287	1291
31-Dec-2006	47.5	1.81	0	1.81	715	717
31-Jan-2007	45.7	0.842	3.53	4.372	1,661	1666
28-Feb-2007	47.5	0.606	5.6	6.206	2,450	2459
31-Mar-2007	43.9	0.234	4.41	4.644	1,695	1700
30-Apr-2007	45.2	1.18	1.18	2.36	887	890
31-May-2007	44.9	0.131	2.94	3.071	1,146	1150
30-Jun-2007	43.7	2.81	2.24	5.05	1,834	1841
31-Jul-2007	42.8	6.75	3.64	10.39	3,696	3709
31-Aug-2007	42.3	3.21	2.35	5.56	1,955	1961
30-Sep-2007	41.9	3.36	1.47	4.83	1,682	1688
31-Oct-2007	41.3	266	0		0	0
30-Nov-2007	40.4	2.1	1.54	3.64	1,222	1226
31-Dec-2007	39.8	2.37	2.16	4.53	1,499	1504
31-Jan-2008	39.5	1.79	1.29	3.08	1,011	1015
29-Feb-2008	41.5	2.64	1.18	3.82	1,318	1322
31-Mar-2008	42.5	1.86	1.18	3.04	1,074	1078
30-Apr-2008	41.8	2.37	1.47	3.84	1,334	1339
31-May-2008	41.7	3.08	3.23	6.31	2,187	2194
30-Jun-2008	41.9	3.92	2.16	6.08	2,118	2125
31-Jul-2008	42.6	2.46	1.79	4.25	1,505	1510

Attachment H

Nitrogen Data

Date	Rolling Annual Average Flow	Nitrite + Nitrate total [as N]	Nitrogen, Kjeldahl, total [as N]	Total Nitrogen	Total Nitrogen	Total Nitrogen (based on rolling annual average flow)
	Million Gallons per Day	mg/l	mg/l	mg/l	lbs/day	lbs/day
31-Aug-2008	43.7	2.81	1.67	4.48	1,627	1633
30-Sep-2008	45	3.34	2.162	5.502	2,058	2065
31-Oct-2008	45.6	3.38	2.35	5.73	2,172	2179
30-Nov-2008	46.1	2.96	1.45	4.41	1,690	1696
31-Dec-2008	47.6	1.73	1.37	3.1	1,227	1231
31-Jan-2009	48.1	3.24	2.07	5.31	2,123	2130
28-Feb-2009	46.7	3.19	3.49	6.68	2,593	2602
31-Mar-2009	45.8	3.39	1.6	4.99	1,900	1906
30-Apr-2009	45.1	3.79	2.31	6.1	2,287	2294
31-May-2009	44.8	5	2.45	7.45	2,774	2784
30-Jun-2009	44.8	4.89	3.2	8.09	3,013	3023
31-Jul-2009	45.1	3.28	2.5	5.78	2,167	2174
31-Aug-2009	44.9	4.88	1.2	6.08	2,269	2277
30-Sep-2009	44	2.87	0	2.87	1,050	1053
31-Oct-2009	43.7	2.743	2.8	5.543	2,014	2020
30-Nov-2009	43.3	0.78	3.4	4.18	1,504	1509
31-Dec-2009	43.3	0.65	10	10.65	3,833	3846
31-Jan-2010	42	1.3	2.5	3.8	1,327	1331
28-Feb-2010	37.3	1.478	2.1	3.578	1,109	1113
31-Mar-2010	38.1	0.67	6.7	7.37	2,334	2342
30-Apr-2010	42.3	3.356	1.8	5.156	1,813	1819
31-May-2010	42.2	1.5	1.5	3	1,052	1056
30-Jun-2010	41.7	5.82	1.7	7.52	2,607	2615
31-Jul-2010	40.2	2.8	2.5	5.3	1,771	1777
31-Aug-2010	39	2.659	2.8	5.459	1,770	1776
30-Sep-2010	38.5	4.42	2	6.42	2,055	2061
31-Oct-2010	38.3	7.569	1.1	8.669	2,760	2769
30-Nov-2010	38.4	2.467	2.2	4.667	1,490	1495
31-Dec-2010	38.1	2.059	1.5	3.559	1,127	1131
31-Jan-2011	37.5	1.28	2.1	3.38	1,054	1057

EXHIBIT C

Attachment H

Nitrogen Data

Date	Rolling Annual Average Flow	Nitrite + Nitrate total [as N]	Nitrogen, Kjeldahl, total [as N]	Total Nitrogen	Total Nitrogen	Total Nitrogen (based on rolling annual average flow)
	Million Gallons per Day	mg/l	mg/l	mg/l	lbs/day	lbs/day
28-Feb-2011	37.3	1.478	2.1	3.578	1,109	1113
31-Mar-2011	38.1	0.669	6.7	7.369	2,334	2342
30-Apr-2011	38.4	0.273	7.6	7.873	2,513	2521
31-May-2011	39.3	0.158	6.4	6.558	2,142	2149
30-Jun-2011	40.4	0.354	7.1	7.454	2,503	2512
31-Jul-2011	41.1	3.17	2.8	5.97	2,040	2046
31-Aug-2011	42.1	1.986	2.1	4.086	1,430	1435
30-Sep-2011	43.8	0.339	2.8	3.139	1,143	1147
31-Oct-2011	44.9	2.363	1.1	3.463	1,292	1297
30-Nov-2011	46.1	2.31	2.1	4.41	1,690	1696
31-Dec-2011	47.4	0.445	2.4	2.845	1,121	1125
31-Jan-2012	48.5	0.016	7.8	7.816	3,151	3161
29-Feb-2012	48.7	0.455	9.6	10.055	4,070	4084
31-Mar-2012	47.2	0.017	5	5.017	1,968	1975
30-Apr-2012	46	0.884	7.2	8.084	3,091	3101
31-May-2012	45	1.766	2.5	4.266	1,596	1601
30-Jun-2012	44.1	0.339	3.9	4.239	1,554	1559
31-Jul-2012	43.6	2.173	1.9	4.073	1,476	1481
31-Aug-2012	43	2.266	1.4	3.666	1,310	1315
30-Sep-2012	41.4	2.675	1.6	4.275	1,471	1476
31-Oct-2012	40.2	0.92	8.1	9.02	3,014	3024
30-Nov-2012	38.6	1.437	13	14.437	4,632	4648
31-Dec-2012	37	0.84	8.4	9.24	2,842	2851
31-Jan-2013	36.1	0.602	9.5	10.102	3,031	3041
28-Feb-2013	35.7	0.393	11	11.393	3,381	3392
31-Mar-2013	35.7	2.848	2.1	4.948	1,468	1473
30-Apr-2013	35.6	1.58	2.9	4.48	1,326	1330
31-May-2013	35.7	0.433	8	8.433	2,503	2511
30-Jun-2013	37	3.81	2.9	6.71	2,064	2071
31-Jul-2013	37.8	2.31	2.9	5.21	1,637	1642

EXHIBIT C

Attachment H

Nitrogen Data

Date	Rolling Annual Average Flow	Nitrite + Nitrate total [as N]	Nitrogen, Kjeldahl, total [as N]	Total Nitrogen	Total Nitrogen	Total Nitrogen (based on rolling annual average flow)
	Million Gallons per Day	mg/l	mg/l	mg/l	lbs/day	lbs/day
31-Aug-2013	38	0.545	10	10.545	3,331	3342
30-Sep-2013	38.1	0.23	15	15.23	4,823	4839
31-Oct-2013	37.9	2.64	2.2	4.84	1,525	1530
30-Nov-2013	37.9	4.539	2.8	7.339	2,312	2320
31-Dec-2013	37.9	5.444	3.8	9.244	2,912	2922
31-Jan-2014	38.5	0.11	2.4	2.51	803	806
28-Feb-2014	38.5	5.29	3.9	9.19	2,941	2951
31-Mar-2014	38.7	3.71	6.1	9.81	3,156	3166
30-Apr-2014	40	2.871	7.2	10.071	3,349	3360
31-May-2014	41	2.64	4.5	7.14	2,433	2441
30-Jun-2014	39.9	4.241	2.7	6.941	2,302	2310
31-Jul-2014	39.6	2.669	1.6	4.269	1,405	1410
31-Aug-2014	39.4	3.237	2.1	5.337	1,748	1754
30-Sep-2014	39.2	7.363	3.2	10.563	3,442	3453
31-Oct-2014	39.4	3.493	2.4	5.893	1,930	1936
30-Nov-2014	39.5	3.11	2.2	5.31	1,743	1749
31-Dec-2014	40	3.099	4.1	7.199	2,394	2402
31-Jan-2015	39.7	3.484	4.1	7.584	2,503	2511
28-Feb-2015	39.4	2.41	5.3	7.71	2,525	2533
31-Mar-2015	39.3	1.149	5.9	7.049	2,303	2310
30-Apr-2015	38.8	1.446	4.1	5.546	1,789	1795
31-May-2015	37.4	2.062	5.6	7.662	2,382	2390
30-Jun-2015	37.4	1.323	5.3	6.623	2,059	2066
31-Jul-2015	37.1	3.08	6.2	9.28	2,862	2871
31-Aug-2015	36.7	5.16	2.8	7.96	2,428	2436
30-Sep-2015	36.6	3.311	4.3	7.611	2,316	2323
31-Oct-2015	36.2	4.686	3.5	8.186	2,463	2471
30-Nov-2015	35.8	5.96	3.2	9.16	2,726	2735
31-Dec-2015	35.2	4.91	2.1	7.01	2,051	2058
31-Jan-2016	35	0.088	3.9	3.988	1,160	1164

EXHIBIT C

Attachment H

Nitrogen Data

Date	Rolling Annual Average Flow	Nitrite + Nitrate total [as N]	Nitrogen, Kjeldahl, total [as N]	Total Nitrogen	Total Nitrogen	Total Nitrogen (based on rolling annual average flow)
	Million Gallons per Day	mg/l	mg/l	mg/l	lbs/day	lbs/day
28-Feb-2016	35.5	1.51	7.1	8.61	2,541	2549
31-Mar-2016	35.3	2.379	4.5	6.879	2,018	2025
30-Apr-2016	34.5	0.935	3.2	4.135	1,186	1190
31-May-2016	34.3	2.043	2.8	4.843	1,381	1385
30-Jun-2016	33.6	0.989	3.5	4.489	1,254	1258
31-Jul-2016	33.1	0.88	5.8	6.68	1,838	1844
31-Aug-2016	33.1	1.431	3.4	4.831	1,334	1334
30-Sep-2016	32.9	4.983	6.5	11.483	3,151	3151
31-Oct-2016	32.9	1.822	4.5	6.322	1,735	1735
30-Nov-2016	32.9	0.455	4.5	4.955	1,360	1360
31-Dec-2016	32.6	0.161	2.8	2.961	805	805
Existing Permit Limit	Report	Report	Report	Report	Report	
Minimim	33.1	0.016	0	0.988	0	0
Maximum	56.33	266	15	15.23	4823	4839
Average	41.73	3.95	2.94	5.46	1846	1852
Standard Deviation	4.39	19.37	2.47	2.36	783	786
No. Measurements	186	186	183	184	186	186
No. Exceedances	NA	NA	NA	NA	NA	NA

EPA REGION 1 NPDES PERMITTING APPROACH FOR PUBLICLY OWNED TREATMENT WORKS THAT INCLUDE MUNICIPAL SATELLITE SEWAGE COLLECTION SYSTEMS

This interpretative statement provides an explanation to the public of EPA Region 1's interpretation of the Clean Water Act ("CWA" or "Act") and implementing regulations, and advises the public of relevant policy considerations, regarding the applicability of the National Pollutant Discharge Elimination System ("NPDES") program to publicly owned treatment works ("POTWs") that are composed of municipal satellite sewage collection systems owned by one entity and treatment plants owned by another ("regionally integrated POTWs"). When issuing NPDES permits to these types of sanitary sewer systems, it is EPA Region 1's practice to directly regulate, as necessary, the owners/operators of the municipal satellite collection systems through a co-permitting structure. This interpretative statement is intended to explain, generally, the basis for this practice. In determining whether to include municipal satellite collection systems as co-permittees in any particular circumstances, Region 1's decision will be made by applying the law and regulations to the specific facts of the case before the Region.

EPA has set out a national policy goal for the nation's sanitary sewer systems to adhere to strict design and operational standards:

> "Proper [operation and maintenance] of the nation's sewers is integral to ensuring that wastewater is collected, transported, and treated at POTWs; and to reducing the volume and frequency of …[sanitary sewer overflow] discharges. Municipal owners and operators of sewer systems and wastewater treatment facilities need to manage their assets effectively and implement new controls, where necessary, as this infrastructure continues to age. Innovative responses from all levels of government and consumers are needed to close the gap."[1]

Because ownership/operation of a regionally integrated POTW is sometimes divided among multiple parties, the owner/operator of the treatment plant many times lacks the means to implement comprehensive, system-wide operation and maintenance ("O & M") procedures. Failure to properly implement O & M measures in a POTW can cause, among other things, excessive extraneous flow (*i.e.*, inflow and infiltration) to enter, strain and occasionally overload treatment system capacity. This failure not only impedes EPA's national policy goal concerning preservation of the nation's wastewater infrastructure assets, but also frustrates achievement of the water quality- and technology-based requirements of CWA § 301 to the extent it results in sanitary sewer overflows and degraded treatment plant performance, with adverse impacts on human health and the environment.

In light of these policy objectives and legal requirements, it is Region 1's permitting practice to subject all portions of the POTW to NPDES requirements in order to ensure that the treatment system as a whole is properly operated and maintained and that human health and water quality impacts resulting from excessive extraneous flow are minimized. The approach of addressing O&M concerns in a regionally integrated treatment works by adding municipal satellite

---

[1] *See Report to Congress: Impacts and Control of CSOs and SSOs* (EPA 833-R-04-001) (2004), at p. 10-2. *See also* "1989 National CSO Control Strategy," 54 Fed. Reg. 37371 (September 8, 1989).

collection systems as co-permittees is consistent with the definition of "publicly owned treatment works," which by definition includes sewage collection systems. Under this approach, the POTW in its entirety will be subject to NPDES regulation as a point source discharger under the Act. Region 1's general practice will be to impose permitting requirements applicable to the POTW treatment plant along with a more limited set of conditions applicable to the connected municipal satellite collection systems.

The factual and legal basis for the Region's position is set forth in greater detail in *Attachment A*.

Attachment A

ANALYSIS SUPPORTING EPA REGION 1 NPDES PERMITTING APPROACH FOR PUBLICLY OWNED TREATMENT WORKS THAT INCLUDE MUNICIPAL SATELLITE SEWAGE COLLECTION SYSTEMS

Exhibit A	List of POTW permits that include municipal satellite collection systems as co-permittees
Exhibit B	Analysis of extraneous flow trends and SSO reporting for representative systems
Exhibit C	Form of Regional Administrator's waiver of permit application requirements for municipal satellite collection systems

Introduction

On May 28, 2010, the U.S. EPA Environmental Appeals Board ("Board") issued a decision remanding to the Region certain NPDES permit provisions that included and regulated satellite collection systems as co-permittees. *See In re Upper Blackstone Water Pollution Abatement District*, NPDES Appeal Nos. 08-11 to 08-18 & 09-06, 14 E.A.D. __ (*Order Denying Review in Part and Remanding in Part*, EAB, May 28, 2010).[2] While the Board "did not pass judgment" on the Region's position that its NPDES jurisdiction encompassed the entire POTW and not only the treatment plant, it held that "where the Region has abandoned its historical practice of limiting the permit only to the legal entity owning and operating the wastewater treatment plant, the Region had not sufficiently articulated in the record of this proceeding the statutory, regulatory, and factual bases for expanding the scope of NPDES authority beyond the treatment plant owner/operator to separately owned/operated collection systems that do not discharge directly to waters of the United States, but instead that discharge to the treatment plant." *Id., slip op.* at 2, 18. In the event the Region decided to include and regulate municipal satellite collection systems as co-permittees in a future permit, the Board posed several questions for the Region to address in the analysis supporting its decision:

> (1) In the case of a regionally integrated POTW composed of municipal satellite collection systems owned by different entities and a treatment plant owned by another, is the scope of NPDES authority limited to owners/operators of the POTW treatment plant, or does the authority extend to owners/operators of the municipal satellite collection systems that convey wastewater to the POTW treatment plant?
>
> (2) If the latter, how far up the collection system does NPDES jurisdiction reach, *i.e.*, where does the "collection system" end and the "user" begin?

[2] The decision is available on the Board's website via the following link: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/30b93f139d3788908525706c005185b4/34e841c87f346d94852577360068976f!OpenDocument.

(3) Do municipal satellite collection systems "discharge [ ] a pollutant" within the meaning of the statute and regulations?

(4) Are municipal satellite collection systems "indirect dischargers" and thus excluded from NPDES permitting requirements?

(5) Is the Region's rationale for regulating municipal satellite collection systems as co-permittees consistent with the references to "municipality" in the regulatory definition of POTW, and the definition's statement that "[t]he term also means the municipality…which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works"?

(6) Is the Region's rationale consistent with the permit application and signatory requirements under NPDES regulations?

See *Blackstone, slip op.* at 18, 20, n. 17.

This regional interpretative statement is, in part, a response to the Board's decision. It details the legal and policy bases for regulating publicly owned treatment works ("POTWs") that include municipal satellite collection systems through a co-permittee structure. Region 1's analysis is divided into five sections. First, the Region provides context for the co-permitting approach by briefly describing the health and environmental impacts associated with poorly maintained sanitary sewer systems. Second, the Region outlines its evolving permitting practice regarding regionally integrated POTWs, particularly its attempts to ensure that such entity's municipal satellite collection systems are properly maintained and operated. Third, the Region explains the legal authority to include municipal satellite collection systems as co-permittees when permitting regionally integrated POTWs. In this section, the Region answers the questions posed by the Board in the order presented above. Fourth, the Region sets forth the basis for the specific conditions to which the municipal satellite collection systems will be subject as co-permittees. Finally, the Region discusses other considerations informing its decision to employ a co-permittee structure when permitting regionally integrated POTWs.

I. Background

A sanitary sewer system (SSS) is a wastewater collection system owned by a state or municipality that conveys domestic, industrial and commercial wastewater (and limited amounts of infiltrated groundwater and some storm water runoff) to a POTW.[3] *See* 40 C.F.R. § 35.2005(b)(37) (defining "sanitary sewer"). The purpose of these systems is to transport wastewater uninterrupted from its source to a treatment facility. Developed areas that are served by sanitary sewers often also have a separate storm sewer system (*e.g.*, storm drains) that collects and conveys runoff, street wash waters and drainage and discharges them directly to a receiving

[3] *See generally* Report to Congress: Impacts and Control of CSOs and SSOs (EPA 833-R-04-001) (2004), from which EPA Region 1 has drawn this background material.

water (*i.e.*, without treatment at a POTW). While sanitary sewers are not designed to collect large amounts of runoff from precipitation events or provide widespread drainage, they typically are built with some allowance for higher flows that occur during periods of high groundwater and storm events. They are thus able to handle minor and controllable amounts of extraneous flow (*i.e.*, inflow and infiltration, or I/I) that enter the system. Inflow generally refers to water other than wastewater—typically precipitation like rain or snowmelt—that enters a sewer system through a direct connection to the sewer. Infiltration generally refers to other water that enters a sewer system from the ground, for example through defects in the sewer.

Municipal sanitary sewer collection systems can consist of a widespread network of pipes and associated components (*e.g.*, pump stations). These systems provide wastewater collection service to the community in which they are located. In some situations, the municipality that owns the collector sewers may not provide treatment of wastewater, but only conveys its wastewater to a collection system that is owned and operated by a different municipal entity (such as a regional sewer district). This is known as a satellite community. A "satellite" community is a sewage collection system owner/operator that does not have ownership of the treatment facility and the wastewater outfall but rather the responsibility to collect and convey the community's wastewater to a POTW treatment plant for treatment. *See* 75 Fed. Reg. 30395, 30400 (June 1, 2010).

Municipal sanitary sewer collection systems play a critical role in protecting human health and the environment. Proper operation and maintenance of sanitary sewer collection systems is integral to ensuring that wastewater is collected, transported, and treated at POTW treatment plants. Through effective operation and maintenance, collection system operators can maintain the capacity of the collection system; reduce the occurrence of temporary problem situations such as blockages; protect the structural integrity and capacity of the system; anticipate potential problems and take preventive measures; and indirectly improve treatment plant performance by minimizing I/I-related hydraulic overloading.

Despite their critical role in the nation's infrastructure, many collection systems exhibit poor performance and are subjected to flows that exceed system capacity. Untreated or partially treated overflows from a sanitary sewer system are termed "sanitary sewer overflows" (SSOs). SSOs include releases from sanitary sewers that reach waters of the United States as well as those that back up into buildings and flow out of manholes into city streets.

There are many underlying reasons for the poor performance of collection systems. Much of the nation's sanitary sewer infrastructure is old, and aging infrastructure has deteriorated with time. Communities also sometimes fail to provide capacity to accommodate increased sewage delivery and treatment demand from increasing populations. Furthermore, institutional arrangements relating to the operation of sewers can pose barriers to coordinated action, because many municipal sanitary sewer collection systems are not entirely owned or operated by a single municipal entity.

The performance and efficiency of municipal sanitary sewer collection systems influence the performance of sewage treatment plants. When the structural integrity of a municipal sanitary sewer collection system deteriorates, large quantities of infiltration (including rainfall-induced infiltration) and inflow can enter the collection system, causing it to overflow. These extraneous flows are among the most serious and widespread operational challenges confronting treatment works.[4]

Infiltration can be long-term seepage of water into a sewer system from the water table. In some systems, however, the flow characteristics of infiltration can resemble those of inflow, *i.e.*, there is a rapid increase in flow during and immediately after a rainfall event, due, for example, to rapidly rising groundwater. This phenomenon is sometimes referred to as rainfall-induced infiltration.

Sanitary sewer systems can also overflow during periods of normal dry weather flows. Many sewer system failures are attributable to natural aging processes or poor operation and maintenance. Examples include years of wear and tear on system equipment such as pumps, lift stations, check valves, and other moveable parts that can lead to mechanical or electrical failure; freeze/thaw cycles, groundwater flow, and subsurface seismic activity that can result in pipe movement, warping, brittleness, misalignment, and breakage; and deterioration of pipes and joints due to root intrusion or other blockages.

Inflow and infiltration impacts are often regional in nature. Satellite collection systems in the communities farthest from the POTW treatment plant can cause sanitary sewer overflows ("SSOs") in communities between them and the treatment plant by using up capacity in the interceptors. This can cause SSOs in the interceptors themselves or in the municipal sanitary sewers that lead to them. The implication of this is that corrective solutions often must also be regional in scope to be effective.

The health and environmental risks attributed to SSOs vary depending on a number of factors including location and season (potential for public exposure), frequency, volume, the amount and type of pollutants present in the discharge, and the uses, conditions, and characteristics of the receiving waters. The most immediate health risks associated with SSOs to waters and other areas with a potential for human contact are associated with exposure to bacteria, viruses, and other pathogens.

Human health impacts occur when people become ill due to contact with water or ingestion of water or shellfish that have been contaminated by SSO discharges. In addition, sanitary sewer systems can back up into buildings, including private residences. These discharges provide a direct pathway for human contact with untreated wastewater. Exposure to land-based SSOs typically occurs through the skin via direct contact. The resulting diseases are often similar to those associated with exposure through drinking water and swimming (*e.g.*, gastroenteritis), but may also include illness caused by inhaling microbial pathogens. In addition to pathogens, raw sewage may contain metals, synthetic chemicals, nutrients, pesticides, and oils, which also can be detrimental to the health of humans and wildlife.

---

[4] In a 1989 Water Pollution Control Federation survey, 1,003 POTWs identified facility performance problems. Infiltration and inflow was the most frequently cited problem, with 85 percent of the facilities reporting I/I as a problem. I/I was cited as a major problem by 41 percent of the facilities (32 percent as a periodic problem).

II. Region 1 Past Practice of Permitting POTWs that Include Municipal Satellite Collection Systems

Region 1's practice in permitting regionally integrated POTWs has developed in tandem with its increasing focus on addressing I/I in sewer collection systems, in response to the concerns outlined above. Up to the early 1990s, POTW permits issued by Region 1 generally did not include specific requirements for collection systems. When I/I and the related issue of SSOs became a focus of concern both nationally and within the region in the mid-1990s, Region 1 began adding general requirements to POTW permits that required the permittees to "eliminate excessive infiltration and inflow" and provide an annual "summary report" of activities to reduce I/I. As the Region gathered more information and gained more experience in assessing these reports and activities, it began to include more detailed requirements and reporting provisions in these permits.

MassDEP also engaged in a parallel effort to address I/I, culminating in 2001 with the issuance of MassDEP Policy No. BRP01-1, "Interim Infiltration and Inflow Policy." Among other provisions, this policy established a set of standard NPDES permit conditions for POTWs that included development of an I/I control plan (including funding sources, identification and prioritization of problem areas, and public education programs) and detailed annual reporting requirements (including mapping, reporting of expenditures and I/I flow calculations). Since September 2001, these requirements have been the basis for the standard operation and maintenance conditions related to I/I.

Regional treatment plants presented special issues as I/I requirements became more specific, as it is generally the member communities, rather than the regional sewer district, that own the collection systems that are the primary source of I/I. Before the focus on I/I, POTW permits did not contain specific requirements related to the collection system component of POTWs. Therefore, when issuing NPDES permits to authorize discharges from regionally integrated treatment POTWs, Region 1 had generally only included the legal entity owning and/or operating the regionally centralized wastewater treatment plant as the permittee. As the permit conditions were focused on the treatment plant and its effluent discharge, a permit issued only to the owner or operator of the treatment plant was sufficient to ensure that permit conditions could be fully implemented and that EPA had authority to enforce the permit requirements.

In implementing the I/I conditions, Region 1 initially sought to maintain the same structure, placing the responsibility on the regional sewer district to require I/I activities by the contributing systems and to collect the necessary information from those systems for submittal to EPA. MassDEP's 2001 Interim I/I Policy reflected this approach, containing a condition for regional systems:

> ((FOR REGIONAL FACILITIES ONLY)) The permittee shall require, through appropriate agreements, that all member communities develop and implement infiltration and inflow control plans sufficient to ensure that high flows do not cause or contribute to a violation of the permittee's effluent limitations, or cause overflows from the permittee's collection system.

As existing NPDES permittees, the POTW treatment plants were an obvious locus of regulation. The Region assumed the plants would be in a position to leverage preexisting legal and/or contractual relationships with the satellite collection systems they serve to perform a coordinating function, and that utilizing this existing structure would be more efficient than establishing a new system of direct reporting to EPA by the collection system owners. The Region also believed that the owner/operator of the POTW treatment plant would have an incentive to reduce flow from contributing satellite systems because doing so would improve treatment plant performance and reduce operation costs. While relying on this cooperative approach, however, Region 1 also asserted that it had the authority to require that POTW collection systems be included as NPDES permittees and that it would do so if it proved necessary. Indeed, in 2001 Region 1 acceded to Massachusetts Water Resources Authority's ("MWRA") request to include as co-permittees the contributing systems to the MWRA Clinton wastewater treatment plant ("WWTP") based on evidence provided by MWRA that its relationship with those communities would not permit it to run an effective I/I reduction program for these collection systems. Region 1 also put municipal satellite collection systems on notice that they would be directly regulated through legally enforceable permit requirements if I/I reductions were not pursued or achieved.

In time, the Region realized that its failure to assert direct jurisdiction over municipal satellite dischargers was becoming untenable in the face of mounting evidence that cooperative (or in some cases non-existent) efforts on the part of the POTW treatment plant and associated satellites were failing to comprehensively address the problem of extraneous flow entering the POTW. The ability and/or willingness of regional sewer districts to attain meaningful I/I efforts in their member communities varied widely. The indirect structure of the requirements also tended to make it difficult for EPA to enforce the implementation of meaningful I/I reduction programs.

It became evident to Region 1 that a POTW's ability to comply with CWA requirements depended on successful operation and maintenance of not only the treatment plant but also the collection system. For example, the absence of effective I/I reduction and operation/maintenance programs was impeding the Region's ability to prevent or mitigate the human health and water quality impacts associated with SSOs. Additionally, these excess flows stressed POTW treatment plants from a hydraulic capacity and performance standpoint, adversely impacting effluent quality. *See Exhibit B* (Analysis of extraneous flow trends and SSO reporting for representative systems). Addressing these issues in regional systems was essential, as these include most of the largest systems in terms of flow, population served and area covered.

The Region's practice of imposing NPDES permit conditions on the municipal collection systems in addition to the treatment plant owner/operator represents a necessary and logical progression in its continuing effort to effectively address the serious problem of I/I in sewer collection systems.[5] In light of its past permitting experience and the need to effectively address

---

[5] Although the Region has in the past issued NPDES permits only to the legal entities owning and operating the wastewater treatment plant (*i.e.*, only a portion of the "treatment works"), the Region's reframing of permits to include municipal satellite collection systems does not represent a break or reversal from its historical legal position. Region 1 has never taken the legal position that the satellite collection systems are beyond the reach of the CWA and the NPDES permitting program. Rather, the Region as a matter of discretion had merely never determined it

the problem of extraneous flow on a system-wide basis, Region 1 decided that it was necessary to refashion permits issued to regionally integrated POTWs to include all owners/operators of the treatment works (*i.e.*, the regional centralized POTW treatment plant and the municipal satellite collection systems).[6] Specifically, Region 1 determined that the satellite systems should be subject as co-permittees to a limited set of O&M-related conditions on permits issued for discharges from regionally integrated treatment works. These conditions pertain only to the portions of the POTW collection system that the satellites own. This ensures maintenance and pollution control programs are implemented with respect to all portions of the POTW. Accordingly, since 2005, Region 1 has generally included municipal satellite collection systems as co-permittees for limited purposes while it required the owner/operator of the treatment plant, as the primary permittee, to comply with the full array of NPDES requirements, including secondary treatment and water-quality based effluent limitations. The Region has identified 25 permits issued by the Region to POTWs in New Hampshire and Massachusetts that include municipal satellite collection systems as co-permittees. *See Exhibit A.* The 25 permits include a total of 55 satellite collection systems as co-permittees.

III. Legal Authority

The Region's prior and now superseded practice of limiting the permit only to the legal entity owning and/or operating the wastewater treatment plant had never been announced as a regional policy or interpretation. Similarly, the Region's practice of imposing NPDES permit conditions on the municipal collection systems in addition to the treatment plant owner/operator has also never been expressly announced as a uniform, region-wide policy or interpretation. Upon consideration of the Board's decision, described above, Region 1 has decided to supply a clearer, more detailed explanation regarding its use of a co-permittee structure when issuing NPDES permits to regionally integrated POTWs. In this section, the Region addresses the questions posed by the Board in the *Upper Blackstone* decision referenced above.

(1) In the case of a regionally integrated POTW composed of municipal satellite collection systems owned by different entities and a treatment plant owned by another, is the scope of

---

necessary to exercise its statutory authority to directly reach these facilities in order to carry out its NPDES permitting obligations under the Act.

Although the Region adopted a co-permittee structure to deal I/I problems in the municipal satellite collection systems, that decision does nothing to foreclose a permitting authority from opting for alternative permitting approaches that are consistent with applicable law. Each permitting authority has the discretion to determine which permitting approach best achieves the requirements of the Act based on the facts and circumstances before it. Upon determining that direct regulation of a satellite collection system via an NPDES permit is warranted, a permitting authority has the discretion to make the owner or operator of the collection system a co-permittee, or to cover it through an individual or general permit. Nothing in EPA regulations precludes the issuance of a separate permit to an entity that is part of the larger system being regulated. As in the pretreatment program, there are many ways to ensure that upstream collection systems are adequately contributing to the successful implementation of a POTW's permit requirements.

[6] EPA has "considerable flexibility in framing the permit to achieve a desired reduction in pollutant discharges." *Natural Resources Defense Council, Inc. v. Costle*, 568 F.2d 1369, 1380 (D.C.Cir.1977). ("[T]his ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all.").

NPDES authority limited to owners/operators of the POTW treatment plant, or does the authority extend to owners/operators of the municipal satellite collection systems that convey wastewater to the POTW treatment plant?

The scope of NPDES authority extends beyond the owners/operators of the POTW treatment plant to include the owners/operators of the municipal satellite collection systems conveying wastewater to the treatment plant for the reasons discussed below.

The CWA prohibits the "discharge of any pollutant by any person" from any point source to waters of the United States, except, *inter alia*, in compliance with an NPDES permit issued by EPA or an authorized state pursuant to Section 402 of the CWA. CWA § 301, 402(a)(1); 40 C.F.R. § 122.1(b).

"Publicly owned treatment works" are facilities that, when they discharge, are subject to the NPDES program. Statutorily, POTWs as a class must meet performance-based effluent limitations based on available wastewater treatment technology. *See* CWA § 402(a)(1) ("[t]he Administrator may…issue a permit for the discharge of any pollutant….upon condition that such discharge will meet (A) all applicable requirements under [section 301]…"); § 301(b)(1)(B) ("In order to carry out the objective of this chapter there shall be achieved…for publicly owned treatment works in existence on July 1, 1977...effluent limitations based upon secondary treatment[.]"); *see also* 40 C.F.R. pt 133. In addition to secondary treatment requirements, POTWs are also subject to water quality-based effluent limits if necessary to achieve applicable state water quality standards. *See* CWA § 301(b)(1)(C). *See also* 40 C.F.R. § 122.44(a)(1) ("…each NPDES permit shall include…[t]echnology-based effluent limitations based on: effluent limitations and standards published under section 301 of the Act") and (d)(1) (same for water quality standards and state requirements). NPDES regulations similarly identify the "POTW" as the entity subject to regulation. *See* 40 C.F.R. § 122.21(a) (requiring "new and existing POTWs" to submit information required in 122.21(j)," which in turn requires "all POTWs," among others, to provide permit application information).

The CWA and its implementing regulations broadly define "POTW" to include not only wastewater treatment plants but also the sewer systems and associated equipment that collect wastewater and convey it to the treatment plants. When a municipal satellite collection system conveys wastewater to the POTW treatment plant, the scope of NPDES authority extends to both the owner/operators of the treatment facility and the municipal satellite collection system, because the POTW is discharging pollutants.

Under section 212 of the Act,

> "(2)(A) The term 'treatment works' means any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature to implement section 1281 of this title, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, outfall sewers, *sewage collection systems* [emphasis added], pumping, power, and other equipment, and their appurtenances; extensions, improvements, remodeling, additions, and alterations thereof; elements essential to provide a reliable recycled supply such as

> standby treatment units and clear well facilities; and any works, including site acquisition of the land that will be an integral part of the treatment process (including land used for the storage of treated wastewater in land treatment systems prior to land application) or is used for ultimate disposal of residues resulting from such treatment.
>
> (B) In addition to the definition contained in subparagraph (A) of this paragraph, 'treatment works' means any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including storm water runoff, or industrial waste, including waste in combined storm water and *sanitary sewer systems* [emphasis added]. Any application for construction grants which includes wholly or in part such methods or systems shall, in accordance with guidelines published by the Administrator pursuant to subparagraph (C) of this paragraph, contain adequate data and analysis demonstrating such proposal to be, over the life of such works, the most cost efficient alternative to comply with sections 1311 or 1312 of this title, or the requirements of section 1281 of this title."

EPA has defined POTW as follows:

> "The term *Publicly Owned Treatment Works* or *POTW* [emphasis in original]…includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works."

See 40 C.F.R. §§ 403.3(q) and 122.2.

Thus, under the CWA and its implementing regulations, wastewater treatment plants and the sewer systems and associated equipment that collect wastewater and convey it to the treatment plants fall within the broad definition of "POTW."

The statutory and regulatory definitions plainly encompass both the POTW treatment plant and municipal satellite collection systems conveying wastewater to the POTW treatment plant even if the treatment plant and the satellite collection system have different owners. Municipal satellite collection systems indisputably fall within the definition of a POTW. First, they are "sewage collection systems" under section 212(A) and "sanitary sewer systems" under section 212(B). Second, they convey wastewater to a POTW treatment plant for treatment under 40 C.F.R. § 403.3(q)). The preamble to the rule establishing the regulatory definition of POTW supports the reading that the treatment plant comprises only one portion of the POTW. *See* 44 Fed. Reg. 62260, 62261 (Oct. 29, 1979).[7] Consistent with Region 1's interpretation, courts have similarly

[7] "A new provision…defining the term 'POTW Treatment Plant' has been added to avoid an ambiguity that now exists whenever a reference is made to a POTW (publicly owned treatment works). …[T]he existing regulation defines a POTW to include both the treatment plant and the sewer pipes and other conveyances leading to it. As a result, it is unclear whether a particular reference is to the pipes, the treatment plant, or both. The term "POTW

taken a broad reading of the terms treatment works and POTW.[8] Finally, EPA has long recognized that a POTW can be composed of different parts, and that sometimes direct control is required under a permit for all parts of the POTW system, not just the POTW treatment plant segment. *See Multijurisdictional Pretreatment Programs Guidance Manual,* Office off Water (4203) EPA 833-B-94-005 (June 1994) at 19. ("If the contributing jurisdiction owns or operates the collection system within its boundaries, then it is a co-owner or operator of the POTW. As such, it can be included on the POTW's NPDES permit and be required to develop a pretreatment program. Contributing jurisdictions should be made co-permittees where circumstances or experience indicate that it is necessary to ensure adequate pretreatment program implementation."). The Region's interpretation articulated here is consistent with the precepts of the pretreatment program, which pertains to the same regulated entity, i.e., the POTW.[9]

Thus, under the statutory and regulatory definitions, a satellite collection system owned by one municipality that transports municipal sewage to another portion of the POTW owned by another municipality can be classified as part of a single integrated POTW system discharging to waters of the U.S.

(2) If the latter, how far up the collection system does NPDES jurisdiction reach, i.e., where does the "collection system" end and the "user" begin?

NPDES jurisdiction extends beyond the treatment plant to the outer boundary of the municipally-owned sewage collection systems, that is, to the outer bound of those sewers whose purpose is to transport wastewater for others to a POTW treatment plant for treatment, as explained below.

As discussed in response to Question 1 above, the term "treatment works" is defined to include "sewage collection systems." CWA § 212. In order to identify the extent of the sewage collection system for purposes of co-permittee regulation—*i.e.*, to identify the boundary between the portions of the collection system that are subject to NPDES requirements and those that are not—Region 1 is relying on EPA's regulatory interpretation of the term "sewage collection system." In relevant part, EPA regulations define "sewage collection system" at 40 C.F.R. § 35.905 as:

---

treatment plant" will be used to designate that portion of the municipal system which is actually designed to provide treatment to the wastes received by the municipal system."

[8] *See, e.g., United States v. Borowski, 977 F.2d 27, 30 n.5* (1st Cir. 1992) ("We read this language [POTW definition] to refer to such sewers, pipes and other conveyances that are publicly owned. Here, for example, the City of Burlington's sewer is included in the definition because it conveys waste water to the Massachusetts Water Resource Authority's treatment works."); *Shanty Town Assoc. v. Envtl. Prot. Agency, 843 F.2d 782, 785* (4th Cir. 1988) ("As defined in the statute, a 'treatment work' need not be a building or facility, but can be any device, system, or other method for treating, recycling, reclaiming, preventing, or reducing liquid municipal sewage and industrial waste, including storm water runoff.") (citation omitted); *Comm. for Consideration Jones Fall Sewage System v. Train,* 375 F. Supp. 1148, 1150-51 (D. Md. 1974) (holding that NPDES wastewater discharge permit coverage for a wastewater treatment plant also encompasses the associated sanitary sewer system and pump stations under § 1292 definition of "treatment work").

[9] The fact that EPA has endorsed a co-permittee approach in addressing pretreatment issues in situations where the downstream treatment plant was unable to adequately regulate industrial users to the collection system in another jurisdiction reinforces the approach taken here.

> "…. each, and all, of the common lateral sewers, within a publicly owned treatment system, which are primarily installed to receive waste waters directly from facilities which convey waste water from individual structures or from private property and which include service connection "Y" fittings designed for connection with those facilities. The facilities which convey waste water from individual structures, from private property to the public lateral sewer, or its equivalent, are specifically excluded from the definition…."

Put otherwise, a municipal satellite collection system is subject to NPDES jurisdiction under the Region's approach insofar as it transports wastewater for others to a POTW treatment plant for treatment. This test (i.e., common sewer installed to receive and carry waste water from others) allows Region 1 to draw a principled, predictable and readily ascertainable boundary between the POTW's collection system and the users. This test would exclude, for example, single user branch drainpipes that collect and transport wastewater from plumbing fixtures in a commercial building or public school to the common lateral sewer, just as service connections from private residential structures to lateral sewers are excluded. This type of infrastructure would not be considered part of the collection system, because it is not designed to receive and carry wastewaters from other users. Rather, it is designed to transport its users' wastewater to such a common collection system at a point further down the sanitary sewer system.

EPA's reliance on the definition of "sewage collection system" from the construction grants regulations for interpretative guidance is reasonable because these regulations at 40 C.F.R. Part 35, subpart E pertain to grants specifically for POTWs, the entity that is the subject of this NPDES policy. Additionally, the term "sewage collection systems" expressly appears in the definition of treatment works under section 212 of the Act as noted above.

(3) Do municipal satellite collection systems "discharge [] a pollutant" within the meaning of the statute and regulations?

Yes, the collection system "discharges a pollutant" because it adds pollutants to waters of the U.S. from a point source. This position is consistent with the definition of "discharge of a pollutant" at 40 C.F.R. § 122. [10] The fact that a collection system may be located in the upper reaches of the POTW and not necessarily near the ultimate discharge point at the treatment plant, or that its contribution may be commingled with other wastewater flows prior to the discharge point, is not material to the question of whether it "discharges" a pollutant and consequently may be subject to conditions of an NPDES permit issued for discharges from the POTW.[11]
40 C.F.R. § 122.2 defines "discharge of a pollutant" as follows:

[10] This position differs from that taken by the Region in the *Upper Blackstone* litigation. There, the Region stated that the treatment plant was the discharging entity for regulatory purposes. The Region has clarified this view upon further consideration of the statute, EPA's own regulations and case law and determined that a municipal satellite collection system in a POTW is a discharging entity for regulatory purposes.

[11] As explained more fully below, non-domestic contributors of pollutants to the collection system and treatment plant do not require NPDES permits because they are regulated through the pretreatment program under Section 307 of the CWA and are specifically excluded from needing an NPDES permit. 40 C.F.R. § 122.3(c).

> "Discharge of a pollutant means:
>
> (a) Any addition of any 'pollutant'' or combination of pollutants to 'waters of the United States'' from any 'point source,' or
> (b) Any addition of any pollutant or combination of pollutants to the waters of the 'contiguous zone' or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.
>
> This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any 'indirect discharger.'"

POTW treatment plants as well as the municipal satellite collection systems that comprise portions of the larger POTW and that transport flow to the POTW treatment plant clearly add pollutants or combinations of pollutants to waters of the U.S. and to waters of the "contiguous zone" and are thus captured under sections (a) and (b) of this definition.[12]

(4) Are municipal satellite collection systems "indirect dischargers" and thus excluded from NPDES permitting requirements?

No, municipal satellite collection systems that convey wastewater from domestic sources to another portion of the POTW for treatment are not "indirect dischargers" to the POTW.

Section 307(b) of the Act requires EPA to establish regulatory pretreatment requirements to prevent the "introduction of pollutants into treatment works" that interfere, pass through or are otherwise incompatible with such works. Section 307 is implemented through the General Pretreatment Regulations for Existing and New Sources of Pollution (40 C.F.R. Part 403) and categorical pretreatment standards (40 C.F.R. Parts 405-471). Section 403.3(i) defines "indirect discharger" as "any non-domestic" source that introduces pollutants into a POTW and is regulated under pretreatment standards pursuant to CWA § 307(b)-(d). The source of an indirect discharge is termed an "industrial user." *Id*. at § 403.3(j). Under regulations governing the

[12] Some municipal satellite collection systems have argued that the addition of pollutants to waters of the United States from pipes, sewers or other conveyances that go to a *treatment plant* are not a "discharge of a pollutant" under 40 C.F.R. § 122.2. This is erroneous. Only one category of such discharges is excluded: indirect discharges. For the reasons explained below in section 4, the satellite system discharges at issue here are not indirect discharges. It is correct that the discharge of wastewater that does not go to the treatment works is included as a discharge under the definition. However, interpreting the *inclusion* of such discharges under the definition as categorically *excluding* the conveyance of other discharges that do go to the treatment works is not a reasonable reading of the regulation. This argument is also flawed in that it incorrectly equates "treatment works," the term used in the definition above, with "treatment plant." To interpret "treatment works" as it appears in the regulatory definition of "discharge of a pollutant" as consisting of only the POTW treatment plant would be inconsistent with the definition of "treatment works" at 40 C.F.R. § 403.3(q), which expressly includes the collection system. *See also* § 403.3(r) (defining "POTW Treatment Plant" as "*that portion* [emphasis added] of the POTW which is designed to provide treatment (including recycling and reclamation) of municipal sewage and industrial waste.")

NPDES permitting program, the term "indirect discharger" is defined as "a non-domestic discharger introducing 'pollutants' to a 'publicly owned treatment works.'" 40 C.F.R. § 122.2. Indirect dischargers are excluded from NPDES permit requirements at 40 C.F.R. § 122.3(c), which provides, "The following discharges do not require an NPDES permit: . . . The introduction of sewage, industrial wastes or other pollutants into publicly owned treatment works by indirect dischargers."

Municipal satellite collection satellite systems are not indirect dischargers as that term is defined under part 122 or 403 regulations. Unlike indirect dischargers, municipal satellite collection systems are not a non-domestic discharger "introducing pollutants" to POTWs as defined in 40 C.F.R. § 122.2. Instead, they themselves fall within the definition of POTW, whose components consist of the municipal satellite collection system owned and operated by one POTW and a treatment system owned and operated by another POTW. Additionally, they are not a non-domestic *source* regulated under section 307(b) that introduces pollutants into a POTW within the meaning of § 403.3(i). Rather, they are part of the POTW and collect and convey municipal sewage from industrial, commercial and domestic users of the POTW.

The Region's determination that municipal satellite collection systems are not indirect dischargers is, additionally, consistent with the regulatory history of the term indirect discharger. The 1979 revision of the part 122 regulations defined "indirect discharger" as "a non-municipal, non-domestic discharger introducing pollutants to a publicly owned treatment works, which introduction does not constitute a 'discharge of pollutants'…" *See* National Pollutant Discharge Elimination System, 44 Fed. Reg. 32854, 32901 (June 7, 1979). The term "non-municipal" was removed in the Consolidated Permit Regulations, 45 Fed. Reg. 33290, 33421 (May 19, 1980) (defining "indirect discharger" as "a nondomestic discharger…"). Although the change was not explained in detail, the substantive intent behind this provision remained the same. EPA characterized the revision as "minor wording changes." 45 Fed. Reg. at 33346 (Table VII: "Relationship of June 7[, 1979] Part 122 to Today's Regulations"). The central point again is that under any past or present regulatory incarnation, municipal satellite collection systems, as POTWs, are not within the definition of "indirect discharger," which is limited to non-domestic sources subject to section 307(b) that introduce pollutants to POTWs.

(5) How is the Region's rationale consistent with the references to "municipality" in the regulatory definition of POTW found at 40 C.F.R. § 403.3(q), and the definition's statement that "[t]he term also means the municipality….which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works?"

There is no inconsistency between the Region's view that municipally-owned satellite collection systems fall within the definition of POTW, and the references to municipality in 40 C.F.R. § 403.3(q), including the final sentence of the regulatory definition of POTW in the pretreatment regulations.

The Region's co-permitting rationale is consistent with the first part of the pretreatment program's regulatory definition of POTW, because the Region is only asserting NPDES jurisdiction over satellite collection systems that are owned by a "State or municipality (as defined by section 502(4) of the Act)." The term "municipality" as defined in CWA § 502(4) "means a city, town, borough, county, parish, district, association, or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes…" Thus, in order to qualify under this definition, a wastewater collection system need only be "owned by a State or municipality." There is no requirement that the constituent components of a regionally integrated POTW, *i.e.*, the collection system and regional centralized POTW treatment plant, be owned by the same State or municipal entity.

Furthermore, there is no inconsistency between the Region's view that a satellite collection system is part of a POTW, and the final sentence of the regulatory definition of POTW in the pretreatment regulations. As noted above, the sentence provides that "POTW" may "also" mean a municipality which has jurisdiction over indirect discharges to and discharges from the treatment works. This is not a limitation because of the use of the word "also" (contrast this with the "only if" language in the preceding sentence of the regulatory definition).

(6) How does the Region's rationale comport with the permit application and signatory requirements under NPDES regulations?

"Any person who discharges or proposes to discharge pollutants"… must comply with permit application requirements set forth in 40 C.F.R. § 122.21 ("Application for a Permit"), including the duty to apply in subsection 122.21(a). It is the operator's duty to obtain a permit. *See* 40 C.F.R. § 122.21(b). An operator of a sewage collection system in a regionally integrated treatment works is operating a portion of the POTW and thus can be asked to submit a separate permit application pursuant to § 122.21(a) (requiring applicants for "new and existing POTWs" to submit information required in 122.21(j)," which in turn requires "all POTWs," among others, to provide permit application information). In the Region's experience, however, sufficient information about the collection system can be obtained from the treatment plant operator's permit application. The NPDES permit application for POTWs solicits information concerning portions of the POTW beyond the treatment plant itself, including the collection system used by the treatment works. *See* 40 C.F.R. § 122.21(j)(1). Where this information is not sufficient for writing permit conditions that apply to a separately owned municipal satellite system, EPA can request that the satellite system to submit an application with the information required in 122.21(j), or alternatively use its authority under CWA section 308 to solicit the necessary information. Because Region 1 believes that it will typically receive information sufficient for NPDES permitting purposes from the POTW treatment plant operator's application, the Region will formalize its historical practice by issuing written waivers to exempt municipal satellite collection systems from permit application and signatory requirements in accordance with 40 C.F.R. § 122.21(j).[13] To the extent the Region requires additional information, it intends to use its information collection authority under CWA § 308.

IV. Basis for the Specific Conditions to which the Municipal Satellite Collection Systems are Subject as Co-permittees

[13] EPA may waive applications for municipal satellite collection systems, when requiring such applications may result in duplicative or immaterial information. The Regional Administrator ("RA") may waive any requirement of this paragraph if he or she has access to substantially identical information. 40 C.F.R. § 122.21(j). *See generally*, 64 Fed. Reg. 42440 (August 4, 1999). The RA may also waive any application requirement that is not of material concern for a specific permit. *Id.*

Section 402(a) of the CWA is the legal authority for extending NPDES conditions to all portions of the municipally-owned treatment works to ensure proper operation and maintenance and to reduce the quantity of extraneous flow into the POTW. This section of the Act authorizes EPA to issue a permit for the "discharge of pollutants" and to prescribe permit conditions as necessary to carry out the provisions of the CWA, including Section 301 of the Act. Among other things, Section 301 requires POTWs to meet performance-based requirements based on secondary treatment technology, as well as any more stringent requirements of State law or regulation, including water quality standards. *See* CWA § 301(b)(1)(B),(C).

The Region imposes requirements on co-permittees when it determines that they are necessary to assure continued achievement of effluent limits based on secondary treatment requirements and state water quality standards in accordance with sections 301 and 402 of the Act, and to prevent unauthorized discharges of sewage from downstream collection systems. With respect to achieving effluent limits, the inclusion of the satellite systems as co-permittees may be necessary when high levels of I/I dilute the strength of influent wastewater and increase the hydraulic load on treatment plants, which can reduce treatment efficiency (*e.g.*, result in violations of technology-based percent removal limitations for BOD and TSS due to less concentrated influent, or violation of other technology-based or water quality-based effluent limitations due to reduction in treatment efficiency). Excess flows from an upstream collection system can also lead to bypassing a portion of the treatment process, or in extreme situations make biological treatment facilities inoperable (*e.g.*, wash out the biological organisms that treat the waste).

By preventing excess flows, the co-permittee requirements will also reduce water quality standards violations that result from SSOs by lessening their frequency and extent. *See Exhibit B* (Analysis of extraneous flow trends and SSO reporting for representative systems). SSOs that reach waters of the U.S. are discharges in violation of section 301(a) of the CWA to the extent not authorized by an NPDES permit.

Imposing standard permit conditions on the satellite communities may be necessary to give full effect to some of the standard permit conditions applicable to all NPDES permits at 40 C.F.R. § 122.41 . To illustrate, NPDES permitting regulations require standard conditions that "apply to all NPDES permits," pursuant to 40 C.F.R. § 122.41, including a duty to mitigate and to properly operate and maintain "all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit." *Id.* at § 122.41(d), (e). If the owner or operator of a downstream POTW treatment plant is unable, due to legal constraints for example, or unwilling to ensure that upstream collection systems are implementing requirements concerning the collection system, such as I/I requirements, making the upstream POTW collection system subject to its own permit requirements may be the only or best available option to give full effect to these permit obligations.

V. Conclusion

For all the reasons above, Region 1 has determined that it is reasonable to, as necessary, directly regulate municipal satellite collection systems as co-permittees when issuing NPDES permits for discharges from regionally integrated treatment works.

Exhibit A

Name	Issue Date
Massachusetts Water Resources Authority – Clinton (NPDES Permit No. MA0100404)	September 27, 2000
City of Brockton (NPDES Permit No. MA0101010)	May 11, 2005
City of Marlborough (NPDES Permit No. MA0100480)	May 26, 2005
Westborough Wastewater Treatment Plant (NPDES Permit No. MA0100412)	May 20, 2005
Lowell Regional Wastewater Utilities (NPDES Permit No. MA0100633)	September 1, 2005
Town of Webster Sewer Department (NPDES Permit No. MA0100439)	March 24, 2006
Town of South Hadley, Board of Selectmen (NPDES Permit No. MA0100455)	June 12, 2006
City of Leominster (NPDES Permit No. MA0100617)	September 28, 2006
Hoosac Water Quality District (NPDES Permit No. MA0100510)	September 28, 2006
Board of Public Works, North Attleborough (NPDES Permit No. MA0101036)	January 4, 2007
Town of Sunapee (NPDES Permit No. 0100544)	February 21, 2007
Lynn Water and Sewer Commission (NPDES Permit No. MA0100552)	March 3, 2007
City of Concord (NPDES Permit No. NH0100331)	June 29, 2007
City of Keene (NPDES Permit No. NH0100790)	August 24, 2007
Town of Hampton (NPDES No. NH0100625)	August 28, 2007
Town of Merrimack, NH (NPDES No. NH0100161)	September 25, 2007
City of Haverhill (NPDES Permit No. MA0101621)	December 5, 2007
Greater Lawrence Sanitary District (NPDES Permit No. MA0100447)	August 11, 2005
City of Pittsfield, Department of Public Works (NPDES No. MA0101681)	August 22, 2008

City of Manchester (NPDES No. NH0100447)	September 25, 2008
City of New Bedford (NPDES Permit No. MA0100781)	September 28, 2008
Winnipesaukee River Basin Program Wastewater Treatment Plant (NPDES Permit No. NH0100960)	June 19, 2009
City of Westfield (NPDES Permit No. MA0101800)	September 30, 2009
Hull Permanent Sewer Commission (NPDES Permit No. MA0101231)	September 1, 2009
Gardner Department of Public Works (NPDES Permit No. MA0100994)	September 30, 2009

Exhibit B

Analysis of extraneous flow trends and SSO reporting for representative systems

I. Representative POTWS

The **South Essex Sewer District (SESD)** is a regional POTW with a treatment plant in Salem, Massachusetts. The SESD serves a total population of 174,931 in six communities: Beverly, Danvers, Marblehead, Middleton, Peabody and Salem. The **Charles River Pollution Control District (CRPCD)** is a regional POTW with a treatment plant in Medway, Massachusetts. The CRPCD serves a total population of approximately 28,000 in four communities: Bellingham, Franklin, Medway and Millis. The CRPCD has been operating since 2001 under a permit that places requirements on the treatment plant to implement I/I reduction programs with the satellite collection systems, while SESD's existing permit does not include specific I/I requirements related to the satellite collection systems, in contrast to Region 1's current practice of including the satellite collection systems as co-permittees.

II. Comparison of flows to standards for nonexcessive infiltration and I/I

Flow data from the facilities' discharge monitoring reports (DMRs) are shown in comparison to the EPA standard for nonexcessive infiltration/inflow (I/I) of 275 gpcd wet weather flow and the EPA standard for nonexcessive infiltration of 120 gallons per capita per day (gpcd) dry weather flow; the standards are multiplied by population served for comparison with total flow from the facility. See *I/I Analysis and Project Certification*, EPA Ecol. Pub. 97-03 (1985); 40 CFR 35.2005(b)(28) and (29).

Figures 1 and 2 show the daily maximum flows (the highest flow recorded in a particular month) for the CRPCD and SESD, respectively, along with monthly precipitation data from nearby weather stations. Both facilities experience wet weather flows far exceeding the standard for nonexcessive I/I, particularly in wet months, indicating that these facilities are receiving high levels of inflow and wet weather infiltration.

Figure 1. CRPCD Daily Maximum Flow Compared to Nonexcessive I/I Standard

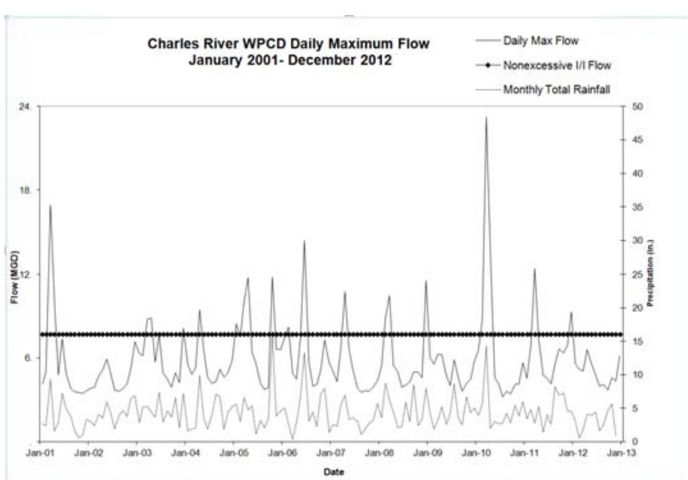
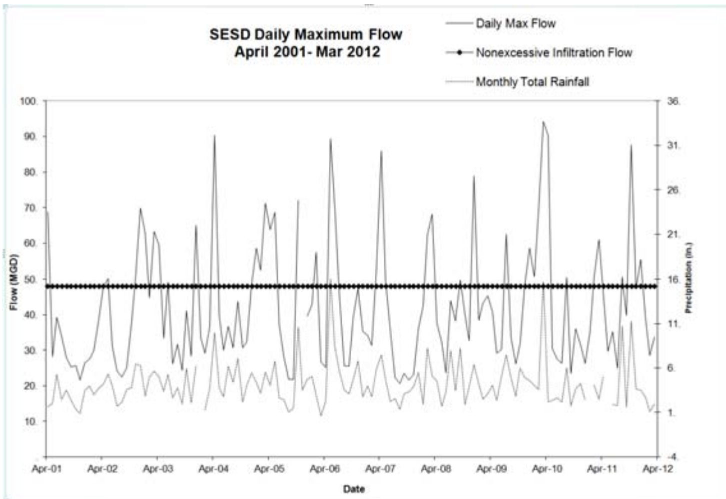


Figure 2. SESD Daily Maximum Flow Compared to Nonexcessive I/I Standard



Figures 3 and 4 shows the average flows for the CRPCD and SESD, which exceed the nonexcessive infiltration standard for all but the driest months. This indicates that these systems experience high levels of groundwater infiltration into the system even during dry weather.

Figure 3. CRPCD 12 Month Average Flow Compared to Nonexcessive Infiltration Standard

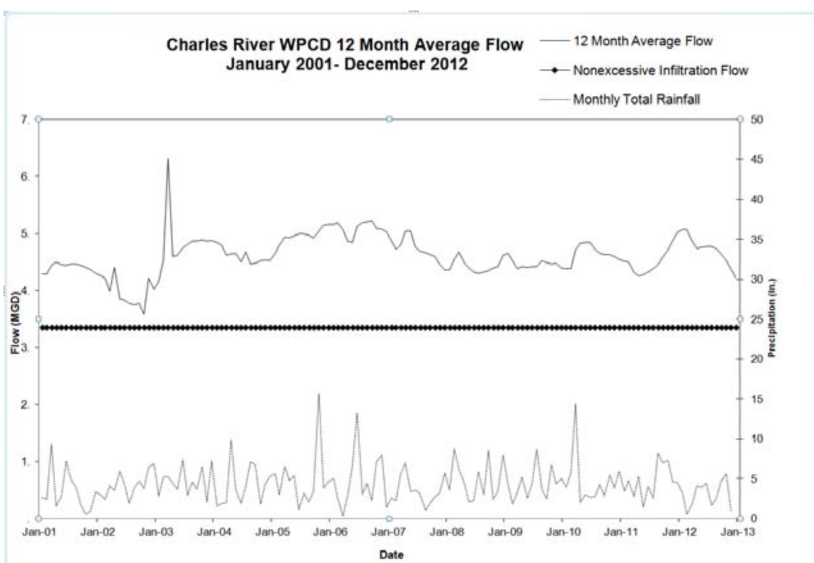
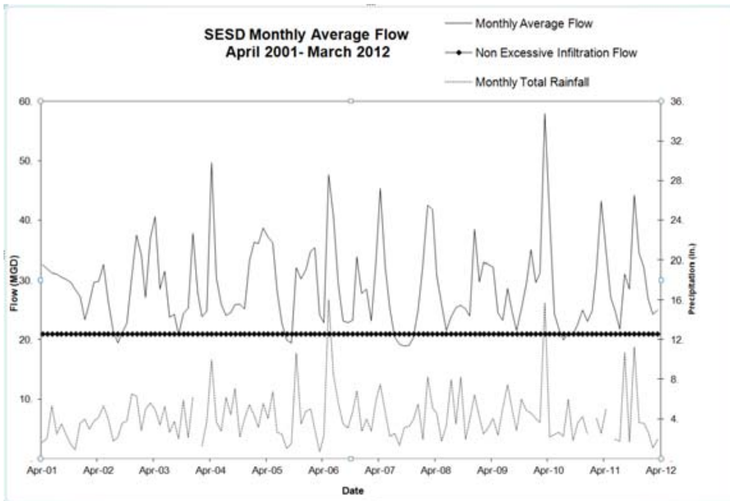


Figure 4. SESD Monthly Average Flow Compared to Nonexcessive Infiltration Standard

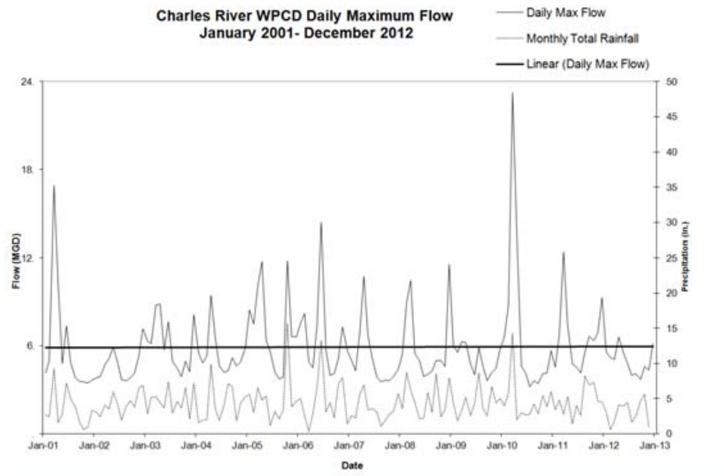


II. Flow Trends

Successful I/I reduction programs should result in decreases in wet weather flows to the treatment plant over the long term. Figures 5 and 6 show the trend in maximum daily flows since 2001. The maximum daily flow reflects the highest wet weather flow for each month. Charts are shown for both the reported maximum daily flow and for a one year rolling average of the maximum daily flow (provided to reduce the impact of seasonality on the regression results). The linear regressions indicates a weak trend over this time period of increasing maximum daily flow; while most of the variability from year to year is due to changes in precipitation, the trends are generally inconsistent with reduction in maximum daily flow over this time period. This indicates that I/I has not been reduced in either system.

Figure 5. CRPCD Daily Maximum Flow Trends

a. Reported Daily Maximum Flows



b. One Year Rolling Average of Daily Maximum Flows

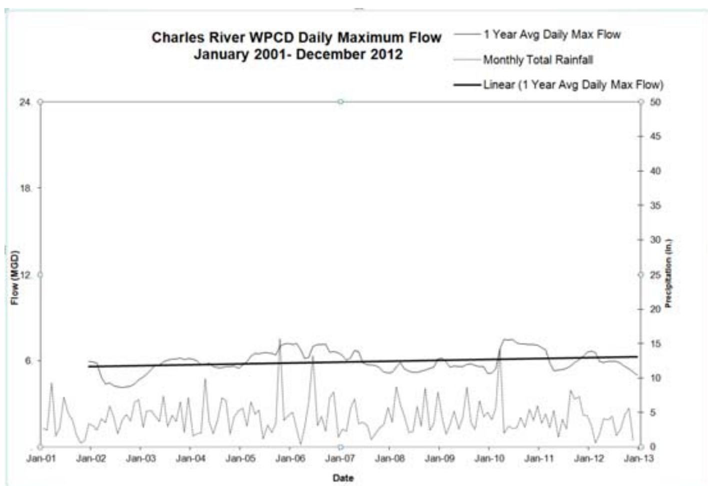
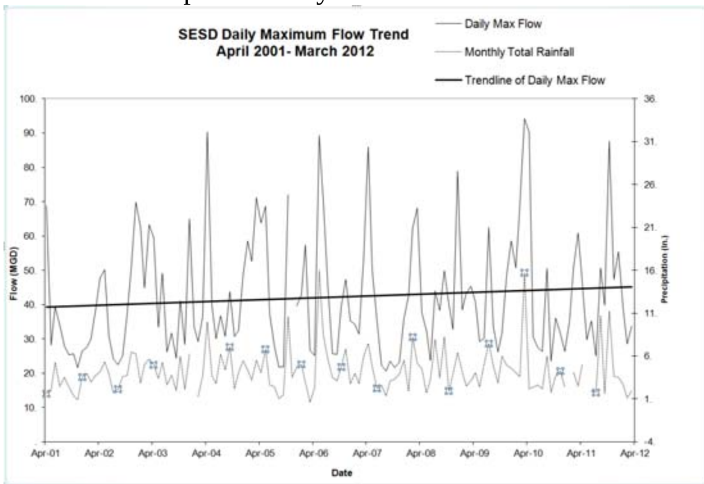
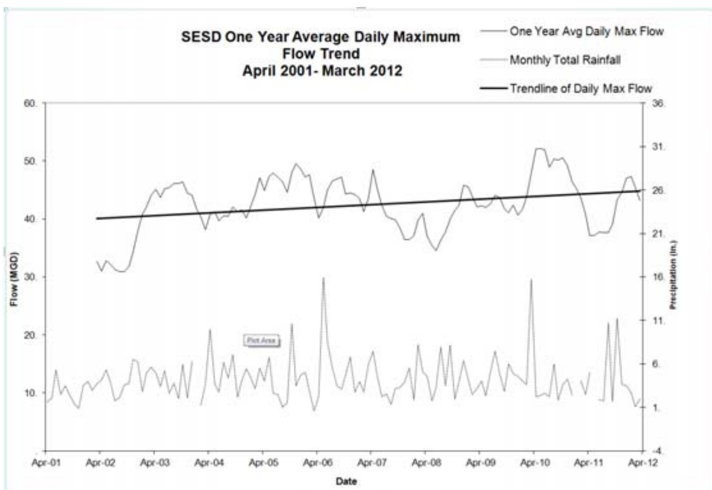


Figure 6. SESD Daily Maximum Flow Trend

a. Reported Daily Maximum Flows



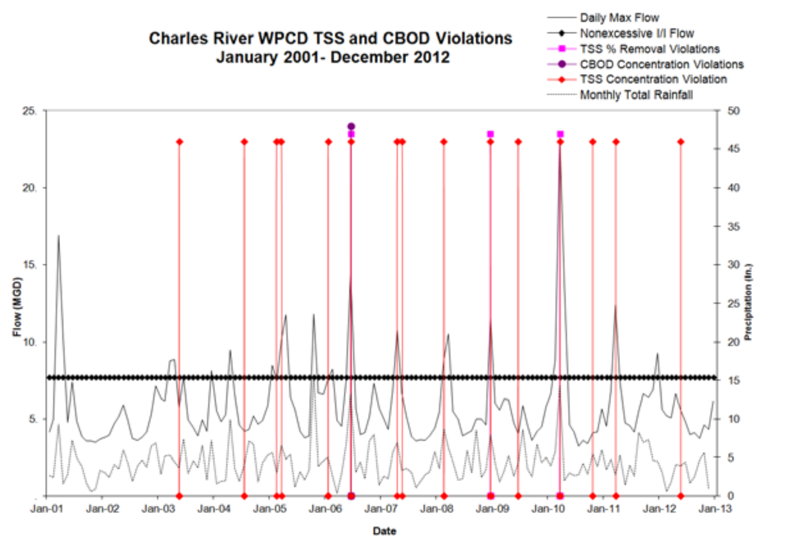
b. One Year Rolling Average of Daily Maximum Flows



III. <u>Violations Associated with Wet Weather Flows</u>

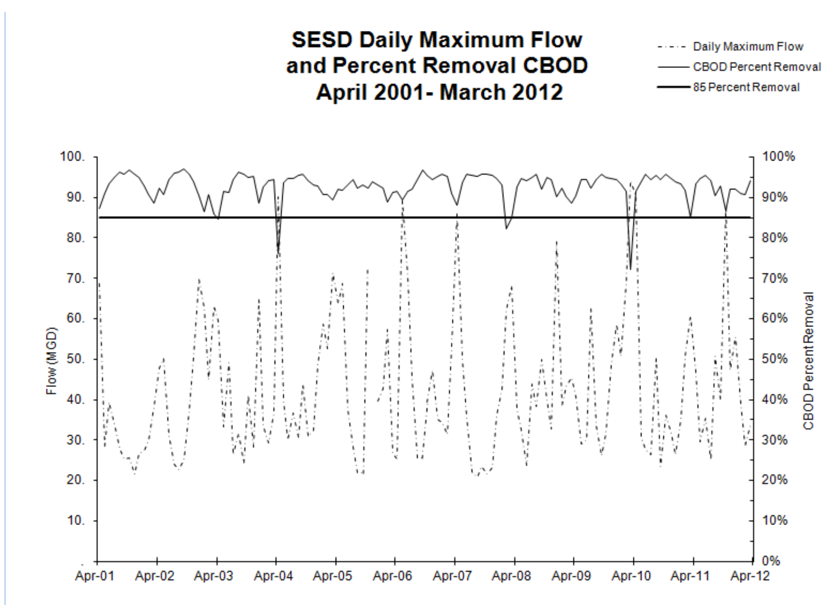
The CRPCD has experienced permit violations that appear to be related to I/I, based on their occurrence during wet weather months when excessive I/I standards are exceeded. Figure 7 shows violations of CRPCD's effluent limits for CBOD (concentration) and TSS (concentration and percent removal). Thirteen of the nineteen violations occurred during months when daily maximum flows exceeded the EPA standard.

Figure 7. CRPCD CBOD and TSS Effluent Limit Violations



In addition, SESD has been unable to achieve the secondary treatment requirement of 85% CBOD removal, also related to I/I. Figure 8 shows SESD's results for removal of CBOD, in percentage, as compared to maximum daily flow. SESD had three months where CBOD removal fell below 85%, all during months with high maximum daily flows. While SESD's current permit requires 85% removal in dry weather, so that these excursions did not constitute permit violations, SESD's proposed draft permit does not limit this requirement to dry weather. Relief from the 85% removal requirement is allowed only when the treatment plant receives flows from CSOs or if it receives less concentrated influent wastewater from separate sewers that is not the result of excessive I/I (including not exceeding the 275 gpcpd nonexcessive I/I standard). 40 CFR § 133.103(a) and (d).

Figure 8. SESD CBOD Percent Removal



IV. SSO Reporting

In addition, both of these regional POTWs have experienced SSOs within the municipal satellite collection systems. In the SESD system, Beverly, Danvers, Marblehead and Peabody have reported SSOs between 2006 and 2008, based on data provided by MassDEP. In the CRPCD system, Bellingham reported SSOs in its system between 2006 and 2009.

Exhibit C

Form of Regional Administrator's or Authorized Delegate's Waiver of Permit Application Requirements for Municipal Satellite Collection Systems

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

Re: Waiver of Permit Application and Signatory Requirements for [Municipal Satellite Sewage Collection System]

Dear ______:

Under NPDES regulations, all POTWs must submit permit application information set forth in 40 C.F.R. § 122.21(j) unless otherwise directed. Where the Region has "access to substantially identical information," the Regional Administrator [or Authorized Delegate] may waive permit application requirements for new and existing POTWs. *Id.* Pursuant to my authority under this regulation, I am waiving NPDES permit application and signatory requirements applicable to the above-named municipal satellite collection systems.

Although EPA has the authority to require municipal satellite collection systems to submit individual permit applications, in this case I find that requiring a single permit application executed by the regional POTW treatment plant owner/operator will deliver "substantially identical information," and will be more efficient, than requiring separate applications from each municipal satellite collection system owner/operator. Municipal satellite collection system owners/operators are expected to consult and coordinate with the regional POTW treatment plant operators to ensure that any information provided to EPA about their respective entities is accurate and complete. In the event that EPA requires additional information, it may use its information collection authority under CWA § 308. 33 U.S.C. § 1318.

This notice reflects my determination based on the specific facts and circumstances in this case. It is not intended to bind the agency in future determinations where a separate permit for municipal satellites would not be duplicative or immaterial.

If you have any questions or would like to discuss this decision, please contact [EPA Contact] at [Contact Info].

Sincerely,

Regional Administrator

Attachment J

EXHIBIT C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

NOV 13 2017

Kimberly Damon-Randall
Assistant Regional Administrator
Protected Resources Division
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Reissuance of the NPDES Permit for the Springfield Regional Wastewater Treatment Facility, Agawam, Massachusetts, Permit No. MA0101613- Endangered Species Act Correspondence

Dear Assistant Regional Administrator Damon-Randall,

The U.S. Environmental Protection Agency, Region I, New England (EPA) is preparing to reissue the NPDES permit for the Springfield Regional Wastewater Treatment Facility (Springfield WWTF) located in Agawam, MA and discharging to the Connecticut River. This permit also incorporates requirements for authorized discharges from the Springfield Water and Sewer Commission's Combined Sewer Overflows (CSOs). In other words, EPA is proposing to integrate the CSO requirements formerly covered by permit no. MA0103331 into the re-issued permit for the Springfield WWTF. The Fact Sheet and Draft Permit will be on public notice on November 15, 2017 and are available for review at: https://www.epa.gov/npdes-permits/massachusetts-draft-individual-npdes-permits.

The comment period will close on December 14, 2017. The Draft Permit is intended to replace the existing NPDES permit in governing the discharges from the WWTF and CSOs. Reissuance of the NPDES permit for this facility will extend authorization for the discharges listed above for five years from the effective date of the permit.
https://www.epa.gov/npdes-permits/massachusetts-draft-individual-npdes-permits
This letter is to request Endangered Species Act (ESA) concurrence from your office for the reissuance of the NPDES permit for the Springfield WWTF. We have made the determination that the proposed activity may affect, but is not likely to adversely affect, any species listed as threatened or endangered, or proposed critical habitat in the Connecticut River for Atlantic sturgeon designated by NMFS under the ESA of 1973, as amended. Our supporting analysis is provided below.

EXHIBIT C

Proposed Project

The Springfield WWTF is designed to treat 67 million gallons per day (MGD) of wastewater from separate and combined sewers in Agawam, MA (lat. 42.086815, long. -72.587976). The treatment process train includes mechanical screens, primary clarification, aerated biological treatment, secondary clarification, chlorine disinfection, sludge thickening and sludge dewatering.

The wastewater collection system consists of both sanitary sewers, which transport domestic, industrial, and commercial wastewater; and combined sewers, which transport domestic, industrial, and commercial wastewater plus stormwater. The WWTF processes water from eight municipalities: Agawam, Springfield, East Longmeadow, Ludlow, West Springfield, Wilbraham, and Chicopee. The total population served (based on information submitted in 2005) is about 279,000. Under normal flow conditions, wastewater is conveyed to the facility through interceptor sewers. During wet weather events in which the combined flow exceeds the hydraulic capacity of the interceptor sewer and/or the wastewater treatment plant, discharges of untreated combined sanitary wastewater and stormwater occur from the CSOs to the Connecticut, Mill and Chicopee Rivers.

The effluent limits and permit conditions imposed have been drafted to assure compliance with the Clean Water Act ("CWA"), 33 U.S.C. sections 1251 et seq., the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53, 314 CMR 3.00 and State Surface Water Quality Standards ("WQS") at 314 CMR 4.00.

Description of the Action Area

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 C.F.R. §402.02). The Springfield WWTF is located on the west bank of the Connecticut River in the Town of Agawam, MA (river kilometer 122) between the Memorial and South End Bridges at the confluence of the Westfield and Connecticut Rivers, as shown in Attachment A. The WWTF discharges to the Connecticut River, while the CSOs discharge to the Connecticut River (13 CSOs), Mill River (7 CSOs), and Chicopee River (4 CSOs). Outfall 42, which is the CSO outfall located at the treatment plant, was not included on the existing CSO permit's list of outfalls; it is included here for completeness. A list of the CSOs is provided as Attachment B to this letter. All receiving waters are designated as Class B Warm Water Fisheries by the MassDEP under the Commonwealth of Massachusetts Surface Water Quality Standards (SWQS). *See* 314 CMR 4.06 Figures 6 and 8. The WWTF is located about 11 miles downstream of the Holyoke Dam. The confluence of the Chicopee River with the Connecticut River (the most upstream of the authorized discharges) is located about 6 miles downstream of the Holyoke Dam.

Sections 303(d) and 305(b) of the Clean Water Act "CWA" require that states complete a water quality inventory and develop a list of impaired waters. Specifically, section 303(d) requires states to identify those waterbodies that are not expected to meet water quality standards following the implementation of technology-based controls and, as such, require the development of a total maximum daily load (TMDL). The Massachusetts Year 2014 Proposed Integrated List of Waters, as well as the final Massachusetts Year 2012 Integrated List of Waters, lists the segment of the Connecticut River into which the treatment plant and combined sewer outfalls discharge (Segment MA 34-05) as a Category 5 water (waters requiring a TMDL for pollutants identified as causing impairment(s)). The pollutants listed as causing the impairment(s) and requiring a TMDL are *E. coli*, total suspended solids, and PCBs in fish tissue (Massachusetts Year 2014 Integrated List of Waters (MassDEP 2014). The segment of the Mill River into which combined sewer overflow outfalls discharge is listed as a category 5 water due to impairment(s) caused by *E. coli*. The segment of the Chicopee River into which combined sewer outfalls discharge is listed as a Category 5 water due to impairment(s) caused by *E. coli*.

NMFS Listed Species (and Critical Habitat) in the Action Area

As the federal agency charged with authorizing the discharges from this facility, EPA has reviewed available habitat information developed by the Services to see if one or more of the federal endangered or threatened species of fish, wildlife, or plants may be present within the influence of the discharge. The following federally listed species may potentially inhabit (seasonally) the Connecticut River in the area of the facility discharge:

Common Name	Species Name	Status
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered
Atlantic Sturgeon	*Acipenser oxyrinchus oxyrinchus*	Threatened

In addition to the presence of these listed species, NMFS designated critical habitat for the Gulf of Maine, New York Bight, Chesapeake Bay, and South Atlantic Distinct Population Segments of Atlantic Sturgeon, which became effective on September 18, 2017. The designated critical habitat includes the Connecticut River from the mouth to the Holyoke Dam (New York Bight Unit 1 Connecticut River), which includes the action area. *See* 82 Fed. Reg. 39160 (August 17, 2017).

Atlantic Sturgeon

The Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) is a species of sturgeon distributed along the eastern coast of North America from Hamilton Inlet, Labrador, Canada to Cape Canaveral, Florida, USA. NMFS has delineated U.S. populations of Atlantic sturgeon into five distinct population segments (DPSs): the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs. *See* 77 Fed. Reg. 5880 (Feb. 6, 2012); 77 Fed. Reg. 5914 (Feb. 6, 2012). NMFS has listed the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs as endangered species. See 77 Fed. Reg. 5912 and 5981-82. NMFS has listed the Gulf of Maine DPS of Atlantic sturgeon as a threatened species and extended the prohibitions under section 9(a)(1) of the ESA to this DPS. *See* 77 Fed. Reg. 5911 and 78 Fed. Reg. 69,310 (Nov. 19, 2013).

The primary factors responsible for the decline of the Atlantic sturgeon DPSs include the destruction, modification, or curtailment of habitat due to poor water quality, dredging and the presence of dams; overutilization due to unintended catch of Atlantic sturgeon in fisheries; lack of regulatory mechanisms for protecting the fish; and other natural or manmade factors including loss of fish through vessel strikes. *See* 77 Fed. Reg. at 5905, 5967.

The general distribution of Atlantic sturgeon includes the Atlantic Ocean waters and associated bays, estuaries, and coastal river systems from Hamilton Inlet, Labrador, Canada to Cape Canaveral, Florida. After emigration from the natal estuary, subadults and adults travel within the marine environment, typically in nearshore waters less than 50 meters in depth characterized by gravel and sand substrate (Stein *et al.* 2004). Spawning typically occurs in well-oxygenated flowing water upriver of the salt front of estuaries on hard substrate such as cobble, hard clay, and bedrock. *See* 82 Fed. Reg. 39162. According to the *Status Review of Atlantic Sturgeon*, Atlantic sturgeon have been documented in the Connecticut River as far as Hadley, MA but regular migration was not thought to extend beyond the significant rapids in Enfield, CT. This species tends to remain in the lower river in the range of the salt wedge. In 2006, one Atlantic sturgeon was observed in the Holyoke Dam spillway upstream of the action area; this was the only instance of an Atlantic sturgeon reported at the Holyoke Dam (NMFS 2007).

Based on the Status Review document, subadult and adult Atlantic sturgeon are unlikely to be present in the action area of this discharge. However, because individuals have been observed on rare occasions in the Connecticut River upstream of the discharge, EPA has evaluated the potential impacts to this species below.

Shortnose Sturgeon

A population of endangered shortnose sturgeon (*Acipenser brevirostrum*) occurs in the Connecticut River. The Holyoke Dam separates shortnose sturgeon in the Connecticut River into an upriver group (from Holyoke Dam to Turners Falls) and a lower river group that occurs from the Dam to Long Island Sound. According to the most recent *Biological Assessment of Shortnose Sturgeon*, the downstream segment includes a concentration of adult and juvenile shortnose sturgeon in the 2-km reach below the Dam from spring through fall (NMFS 2010). Another year-round concentration has been observed in the 9-km reach near Agawam, MA, immediately downstream the action area. This area appears to serve both as habitat for foraging during spring, summer, and fall and as a wintering site (Kynard et al. 2012). Sturgeon may also enter the tributaries. Although no shortnose sturgeon have been observed in the Chicopee or Mill Rivers, an adult shortnose sturgeon was observed in a fish trap on the Westfield River downstream of the DSI Dam in May 2007. Ongoing modifications designed to enhance upstream passage for sturgeon and downstream passage at the dam may improve connectivity of the upstream and downstream groups of shortnose sturgeon.

Early life stages (including eggs and larvae) have been captured downstream of the Holyoke Dam periodically during surveys in the mid-1980s, in 1995, and in 1998-1999; however, evidence suggests that spawning in the downstream segment is minimal (NMFS 2010). In 2005-2006, three shortnose sturgeon larvae were captured during ichthyoplankton sampling, although no early life stages were captured during surveys conducted from Hartford to Holyoke during the same period. It is unknown whether the captured larvae were spawned downstream of the dam or the result of downstream dispersal following a rare spawning event at the Holyoke Dam. In any case, it is evident that, while rare, early life stages of shortnose sturgeon may be present in the action area.

Atlantic Sturgeon Critical Habitat

NMFS has recently designated critical habitat for Atlantic sturgeon. *See* 82 Fed. Reg. 39160 (August 17, 2017). Critical habitat is defined as the specific areas within the geographical area occupied by the species at the time it is listed on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protections, and specific areas outside the geographical area occupied by the species at the time it is listed that are essential for the conservation of the species. *See* 16 U.S.C. 1532(5)(A) and 50 C.F.R. § 424.02(d). The physical features essential for reproduction and recruitment of Atlantic sturgeon include: hard bottom substrate for settlement of fertilized eggs, refuge, growth, and development of early life stages; aquatic habitat with gradual downstream salinity gradient of 0.5 to 30 parts per thousand and soft substrate downstream of spawning sites for juvenile foraging and development; water of appropriate depth and absent physical barriers to passage between the river mouth and spawning sites necessary to support unimpeded movement to and from spawning sites, seasonal and physiologically dependent movement of juveniles to appropriate salinity zones in the estuary, and staging, resting, or holding of subadults or spawning adults; and temperature, salinity, and oxygen values in the water that support spawning, survival, growth, development, and recruitment. *See* 82 Fed. Reg. 39161.

Based on the Status Review document, Atlantic sturgeon are unlikely to be present in the action area of this discharge. However, designated critical habitat for the New York Bight designated population segment (DPS) includes the Connecticut River from the Holyoke Dam downstream for 140 river kilometers to the mouth of the river where it discharges to Long Island Sound. The designated critical habitat encompasses the action area.

Effects Determination

Effects of this action on Atlantic sturgeon, shortnose sturgeon, and designated critical habitat for Atlantic sturgeon primarily include water quality impacts as a result of discharges of sanitary wastewater from the WWTF and untreated combined sanitary wastewater and stormwater from CSOs during wet weather. The effluent is unlikely to affect physical features essential to the conservation of the species, including the substrate, water depth, and fish passage.

The Draft Permit includes water quality-based effluent limitations on all pollutants for which the WWTF has a reasonable potential to cause, or contributes to, an exceedance of water quality standards in the receiving water. Water quality-based effluent limitations are established using available dilution at the 7Q10 low flow value, as required by state water quality standards (314 CMR 4.03(3)). For the Springfield WWTF, effluent limitations on total residual chlorine are based on a dilution factor of

25 calculated using the design flow of the WWTF (67 MGD) and a 7Q10 low flow in the Connecticut River at Outfall 041 of 2,435 cfs. The Draft Permit limits on biochemical oxygen demand and total suspended solids are consistent with the technology-based standards for secondary treatment for the protection of dissolved oxygen in the receiving waters. The Draft Permit also includes a numeric limit for acute toxicity ($LC_{50} \geq 100\%$).

EPA expects that this whole effluent toxicity requirement will ensure protection of aquatic life in the vicinity of the discharge, including from the cumulative effects of any constituents in the effluent. The effluent limits and permit conditions in the Draft Permit will ensure that the permitted activity will not change water quality in any significant way, that is, any effect are unable to be meaningfully measured, detected, or evaluated. In addition, the permitted activity is unlikely to affect the ability of critical habitat to support spawning, survival of any life stage, or larval, juvenile, or subadult growth, development, or recruitment.

<u>Biochemical Oxygen Demand</u>

Biological oxygen demand (BOD_5) measures the amount of oxygen used by aerobic microorganisms in the water column in order to approximate the availability of dissolved oxygen for fish, invertebrates, and other aerobic aquatic organisms. TSS and BOD_5 have the potential to affect dissolved oxygen concentrations in the vicinity of and downstream from the facility's outfall. The Massachusetts Surface Water Quality Standards for Class B Inland Water Classes (which includes the Connecticut River) require that dissolved oxygen levels shall not be less than 5.0 mg/l.

The Draft Permit includes the same BOD_5 limits as in the current permit, which are based on the secondary treatment requirements set forth at 40 C.F.R. §§ 133.102(a)(1), (2), (4) and 40 C.F.R. § 122.45(f). The mass-based limitations for BOD_5 are based on a 67 MGD design flow. The monitoring frequency is once per day.

EPA has determined that these effluent limits are sufficient to ensure that discharges from this facility do not cause an excursion below the Massachusetts Water Quality Standard, which requires that Class B waters attain a minimum DO saturation of 5.0 mg/l. Studies indicate that the average sensitivity of sturgeons to hypoxia is more than other fishes, and that hypoxic conditions impair respiratory metabolism, foraging activity, growth, and survival (Secor and Niklitschek 2002, Cech and Doloshov 2004, Niklitschek and Secor 2009). NMFS indicates that shortnose sturgeon are adversely affected upon exposure to dissolved oxygen levels below 5.0 mg/L (EPA 2004). In setting dissolved oxygen criteria for Chesapeake Bay, NMFS concurred with EPA that the instantaneous minimum dissolved oxygen criteria of 5 mg/L would protect spawning and migratory shortnose sturgeon and improve the chances for recovery of the Chesapeake Bay population (EPA 2004). The Final Rule for Atlantic Sturgeon Designated Critical Habitat identifies 6.0 mg/L or greater DO to support juvenile rearing habitat, however, the effects of the discharge are likely to be discountable because the juvenile stage is typically in brackish waters of the natal estuary, well downstream of the action area. *See* 82 Fed. Reg. 39161-62.

The BOD_5 criteria, which are established to ensure that the DO level will not be less than the Massachusetts water quality standard of 5.0 mg/L for Class B waters, will be protective of Atlantic sturgeon and shortnose sturgeon and critical habitat in the Connecticut River. As a result, the effluent will have an insignificant effect on Atlantic and shortnose sturgeon.

Total Suspended Solids

TSS may affect aquatic life by directly killing them, reducing growth rates, reducing resistance to disease, preventing the development of fish eggs and larvae, by altering natural migration and movement patterns, and by reducing their ability to forage or limiting the food supply (EPA 1976). The Draft Permit proposes the same TSS limits as in the current permit, which are based on the secondary treatment requirements set forth at 40 C.F.R. §§ 133.102(a)(1), (2), (4) and 40 C.F.R. § 122.45(f). The secondary treatment limitations are a monthly average TSS concentration of 30 mg/l and a weekly average concentration of 45 mg/l. The Draft Permit also requires the permittee to report the maximum daily TSS value each month. The mass-based limitations for TSS are based on a 67 MGD design flow. The monitoring frequency is once per day.

Studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations greater than 580 mg/L to 700,000 mg/L, depending on species. Sublethal effects have been observed at substantially lower turbidity levels. For example, prey consumption was significantly lower for striped bass larvae tested at concentrations of 200 and 500 mg/L compared to larvae exposed to 0 and 75 mg/L (Breitburg 1988 *in* Burton 1993). Studies with striped bass adults showed that pre-spawners did not avoid concentrations of 954 to 1,920 mg/L to reach spawning sites (Summerfelt and Moiser 1976 and Combs 1979 *in* Burton 1993). While there have been no directed studies on the effects of TSS on sturgeon, shortnose sturgeon have been documented in turbid water in the juvenile and adult stage. Dadswell et al. (1984) reports that shortnose sturgeon are more active under lowered light conditions, such as those in turbid waters. As such, sturgeon species are assumed to be as least as tolerant to suspended sediment as other estuarine fish such as striped bass.

TSS may also indirectly affect sturgeon through impacts on prey species. For instance, benthic invertebrates may experience reductions in species diversity, survival, reproduction, and an increase in mortality when exposed to high concentrations of suspended solids over long time periods. However, most of the concentrations under which these impacts were observed were well above 45 mg/L, which is the maximum daily effluent limit for TSS in the Draft Permit (Bilotta and Brazier 2008). The TSS limits in the Draft Permit will likely ensure that prey species of sturgeon are not impacted by the discharge, and indirect effects to sturgeon as a result will be insignificant.

There is little research on the effects of suspended solids on shortnose sturgeon eggs and larvae. However, studies of other species suggest that these early life stages may be more sensitive to suspended solids than adults and juveniles. Auld and Schubel (1978) observed that concentrations of up to 1,000 mg/L had no significant effect on percent hatched for blueback herring, alewife, American shad, and yellow perch eggs, while striped bass and white perch eggs tolerated exposures of up to 500 mg/L TSS without a significant effect on hatching. Striped bass and yellow perch larval survival was significantly affected at concentrations of 500 mg/L, while American shad larval survival was significantly affected at TSS concentrations of 100 mg/L. Kiørboe et al. (1981) found no effect of chronic concentrations of suspended silt up to 300 mg/L on embryonic development of herring eggs (*Clupea harengus*). In comparison, the maximum daily TSS concentration authorized in the Draft Permit is 45 mg/L, which is well below the concentrations found to affect early life stages. The authorized discharge of TSS from the facility is also unlikely to affect the temperature, salinity, or oxygen values to support spawning, survival, growth, development, or recruitment.

EPA has made the preliminary determination that the effluent from this facility is likely to have an insignificant effect on Atlantic sturgeon and shortnose sturgeon as well as critical habitat for Atlantic sturgeon.

Percent Removal of BOD_5 and TSS

Percent removal requirements are also included in the secondary treatment standards of 40 C.F.R. § 133.102, requiring a minimum of 85% percent removal for BOD_5 and TSS on an average monthly basis. However, combined sewer systems may receive case-by-case consideration because they may not be capable of meeting the percentage removal requirements during wet weather where the treatment works receive flows from combined sewers (*i.e.*, sewers which are designed to transport both storm water and sanitary sewage). *See* 40 C.F.R. § 133.103(a). The Regional Administrator or State Director (if appropriate) may substitute a lower percent removal requirement less than 85% or a mass loading limit for percent removal requirements. *See* 40 C.F.R. § 133.103(e).

In this case, the current permit had suspended the 85% removal requirement during all conditions. The Draft Permit reinstates the 85% removal requirement during dry weather because data reported over the past 5 years indicates that the treatment works would have consistently met the percent removal requirements on an average monthly basis. The Draft Permit continues to suspend the percent removal requirements during wet weather. EPA believes that establishing percent removal requirements for BOD_5 and TSS during dry weather, in combination with the technology-based limits consistent with secondary treatment requirements, will ensure that the effluent from the WWTF is likely to have an insignificant effect on Atlantic and shortnose sturgeon and critical habitat.

pH

The Draft Permit includes pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 C.F.R. § 133.102(c). The pH of the effluent shall not be less than 6.5 or greater than 8.3 standard units at any time. The water quality-based numeric effluent limitations for pH in the

Draft Permit are likely to protect water quality and will have an insignificant effect on Atlantic sturgeon and shortnose sturgeon as well as designated critical habitat.

Bacteria

Escherichia coli bacteria is an indicator of the presence of fecal wastes from warm-blooded animals. As this bacteria is often associated with viruses and other pathogens, the primary concern regarding elevated levels of these bacteria is for human health and exposure to pathogen-contaminated recreational waters. Fecal bacteria, such as *E. coli*, are associated with fecal matter, which is known to contain nutrients that support plant and animal growth. Algae and other organisms which utilize these nutrients can lower dissolved oxygen levels under certain environmental conditions (particularly warm water conditions). While fecal bacteria are not known to be toxic to aquatic life, elevated levels of these bacteria are indicative of water quality problems including lowered dissolved oxygen levels.

The Draft Permit's proposed limits are in accordance with the Massachusetts State Water Quality Standards for Class B Inland Waters: average monthly limit equal to a geometric mean of 126 colonies per 100 ml and an instantaneous maximum daily limit of 409 colonies per 100 ml. *See* 314 CMR 4.05(3)(b)(4)(b). Monitoring is required five times per week from April 1 through October 31.

The bacterial limits set for in the Draft Permit are designed to protect human health and also to insure that dissolved oxygen criteria are met in the receiving water body. As indicated above, the monthly dissolved oxygen level set for this receiving water (5.0 mg/L) is protective of shortnose sturgeon. As such, EPA has made the preliminary determination that the bacteria limits proposed in the Draft Permit are not likely to adversely affect shortnose sturgeon, critical habitat, or contribute to an excursion above water quality criteria set for this portion of the Connecticut River.

Total Residual Chlorine

The Springfield WWTF uses chlorination and dechlorination of secondary effluent. Chlorine can be toxic to aquatic life. In an analysis of exposure of 33 freshwater species in 28 genera, acute effect concentrations ranged from 28 μg/L for *Daphia magna* to 710 μg/L for the threespine stickleback (EPA 1986). The acute and chronic water quality criteria for chlorine defined in the 2002 EPA National Recommended Water Quality Criteria for freshwater are 13 μg/l and 7.5 μg/l, respectively. Both the nationally recommended acute and chronic criteria are set well below the minimum effect values observed in any species tested. As the water quality criteria levels have been set to be protective of even the most sensitive of the 33 freshwater species tested, EPA has judged that the criteria are also likely to be protective of shortnose sturgeon.

Given these criteria and a dilution factor of 25, the Draft Permit includes a maximum daily limit of 0.46 mg/l and average monthly limit of 0.26 mg/l for total residual chlorine. Sampling frequency is five times per week and the limits apply year-round when chlorine is in use. EPA expects that the water quality-based numeric limits are protective of aquatic life and chlorine in the effluent will have an insignificant effect on Atlantic sturgeon, shortnose sturgeon, and designated critical habitat.

Metals

The release of metals into surface waters from anthropogenic activities such as discharges from municipal wastewater treatment facilities can result in their accumulation to levels that are highly toxic to aquatic life. EPA analyzed the available effluent and receiving water metals data from WET testing data collected from 2009 through 2014 to determine whether various metals "are or may be discharged at a level that causes, has reasonable potential to cause, or contributes to an excursion above" water quality standards. 40 C.F.R. § 122.44(d)(1)(i). The applicable water quality criteria for metals are the EPA National Recommended Water Quality Criteria 2002, which have been incorporated into the Massachusetts SWQS, 314 CMR 4.05 (5)(e).

As described in the Fact Sheet (at 14-16), based on the 95th percentile of the distribution of effluent data and the median upstream concentrations, there is no reasonable potential (for either acute or chronic conditions) that the discharge of metals will cause or contribute to an exceedance of the applicable water quality criteria. The Draft Permit establishes quarterly whole effluent toxicity (WET) testing requirements and includes an acute toxicity limit (LC_{50}) of greater than or equal to 100% survival as well as monitoring for lead, aluminum, copper, cadmium, nickel, and zinc. The quarterly WET limit and effluent monitoring requirements will likely ensure that the effluent is protective of aquatic life and as such, will have an insignificant effect on Atlantic sturgeon, shortnose sturgeon, and designated critical habitat.

Nitrogen

EPA has determined that excessive nitrogen loadings into the Connecticut River and tributaries are causing significant water quality issues in Long Island Sound which is located approximately 75 miles downstream from the facility. Nitrogen causes impairment via excessive primary productivity and while is not known to be directly toxic to aquatic life, elevated nitrogen levels are associated with eutrophication and indicative of water quality problems that may include lowered dissolved oxygen levels. These indirect impacts may affect sturgeon in the action area.

In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a Total Maximum Daily Load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation (WLA) for point sources and a Load Allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL. *See* A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound (CT DEP 2000). The overall TMDL target of a 25 percent aggregate reduction from baseline loadings to the Connecticut River above the Massachusetts-Connecticut border is currently being met.

EPA has determined that, because the TMDL limit is being met for the Connecticut River at the Massachusetts/Connecticut state line, an effluent limitation on nitrogen discharges from the Springfield WWTF is not required at this time. However, the Draft Permit increases the monitoring frequency from monthly to weekly to provide an improved baseline for assessing optimization of nitrogen removal and ensure that excessive nitrogen loading is prevented. The Draft Permit also requires the WWTF to continue optimizing operations for nitrogen.

Ammonia can be toxic to aquatic life and is also an oxygen-demanding pollutant whose biological decomposition may cause reduced dissolved oxygen concentrations in the receiving water. EPA also evaluated if the effluent had a reasonable potential to cause or contribute to an exceedance of the acute or chronic ammonia water quality criteria under both summer and winter conditions (Fact Sheet pp. 18-20). Using the 7Q10 low flow value (which is more stringent than the 30Q10 flow that EPA recommends using for the analysis but which was not available for the receiving water), the projected downstream ammonia concentrations in the summer and winder periods are 0.29 and 0.45 mg/l, respectively. Even under the more conservative assumption using 7Q10 flow, these values are less than the acute criteria of 26.7 mg/L, the summer chronic criteria of 3.14 mg/L, and the winter chronic criteria of 6.17 mg/L. Therefore, reasonable potential does not exist for the discharge of ammonia from the facility to cause or contribute to a violation of water quality standards.

Weekly monitoring of total nitrogen, total ammonia nitrogen, total nitrate+nitrite, and total kjeldahl nitrogen, coupled with optimizing operations to further reduce nitrogen loading to the Connecticut River, will likely ensure that the WWTF is not discharging nitrogen at a level that could impact dissolved oxygen levels that may affect shortnose sturgeon or designated critical habitat. EPA expects that these requirements will likely be protective of aquatic life and as such, the discharge of nitrogen will have an insignificant effect on Atlantic sturgeon, shortnose sturgeon, and designated critical habitat.

Combined Sewer Overflows

CSOs are point sources subject to NPDES permit requirements for both water-quality based and technology-based requirements but are not subject to the secondary treatment regulations applicable to publicly owned treatment works in accordance with 40 CFR §133.103(a). Section 301(b)(1)(C) of the Clean Water Act of 1977 mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Water Quality Act Amendments of 1987 (WQA). The framework for compliance with Clean Water Act requirements for CSOs is set forth in EPA's National CSO Control Policy, 59 Fed. Reg. 18688 (1994).

The treatment facility's sewer collection system consists partially of combined sewers that convey both sanitary sewage and stormwater runoff during rain events. During wet weather, the combined flow exceeds the capacity of the interceptor sewers and the wastewater treatment plant, and a portion of the combined flow is discharged to the Connecticut, Chicopee, and Mill Rivers through combined sewer overflows (CSOs). The system currently has 24 CSO outfalls where the CSOs discharge to receiving waters. A complete list of CSOs has been included as Attachment A to this letter. In 2014, the system had combined overflows of 378 million gallons, as well as discharges of 121 million gallons of partially treated sewage from the treatment plant. CSOs have been identified as a significant source of pollution to the Connecticut and Chicopee Rivers. See the Massachusetts Department of Environmental Protection's 2003 Connecticut River and 2003 Chicopee River Water Quality Assessments.

Coverage for discharges from the CSOs was provided by EPA to the City of Springfield in 1995 (Permit No. MA010333) because, at that time, the city owned and operated both the sewer system and the treatment facility. The Springfield Water and Sewer Commission (SWSC) was established in 1996 and subsequently took over ownership of both the treatment facility and the CSOs in the City of Springfield. Ownership of the satellite collection systems remained with their respective municipalities. For re-issuance of this permit, EPA has proposed combining the permit covering CSO discharges (MA010333) with this individual permit for the Springfield WWTF (MA0101613), both of which are owned and operated by the SWSC. The six municipalities that operate CSOs covered under this permit have been included as co-permittees.

The CSO Policy recommends that each community that has a combined sewer system develop and implement a long-term CSO control plan ("LTCP") that will ultimately result in compliance with the requirements of the CWA. The Commission submitted a Draft Long Term Control Plan Phase I Program in 2000, and a revised draft LTCP in May 2012. The plan has not been completely approved. The SWSC is currently operating under federal administrative orders (latest being Administrative Order Docket No. 14-007 issued September 2014), requiring various projects to reduce or eliminate CSO discharges.

When the capacity of the combined sewer collection system has been exceeded, subsequent overflows are released from CSOs into the Connecticut, Chicopee, and Mill Rivers. When these discharges occur, the receiving waters are running at high flows and volumes as a result of the storm event. TSS and bacteria are primary constituents of CSO discharges. The monthly mean streamflow of the Connecticut River (based on 10 years of record at USGS Gage 01172010 at I-391 Bridge in Holyoke, MA) ranges from 8,630 cfs in September to 36,800 cfs in April with a minimum mean flow of 2,884 cfs in September 2007. The monthly mean streamflow of the Chicopee River (based on 86 years of record at USGS Gage 01177000 at Indian Orchard, MA) ranges from 462 cfs in August to 1,830 cfs in April with a minimum mean flow of 176.5 cfs in August 1950. The USGS Gage 01178000 (Mill River at Springfield, MA) is no longer active, but based on streamflow records from 1938 to 1951, the mean daily streamflow at this gage was 43 cfs with a maximum daily flow of 306 cfs.

Streamflow increases during storm events and equates to potentially high dilution factors. A relatively high dilution factor during storm events, which is the only time that CSOs would be discharging, will help to ensure that water quality criteria are met and dissolved oxygen levels are not reduced. CSO discharges are subject to specific conditions of the Draft Permit, including:

- Dry weather discharges from CSO outfalls are prohibited
- During wet weather, the discharges must not cause any exceedance of water quality standards. Wet weather discharges must be monitored and reported as specified in the permit.
- The permittee shall meet the technology-based nine minimum controls, set forth in the Fact Sheet, complying with the implementation levels as set forth in Part I.B.3 of the Draft Permit.
- The permittee shall submit updated documentation on its implementation of the Nine Minimum Controls within 6 months of the effective date of the permit, and shall provide an annual report on monitoring results from CSO discharges and the status of CSO abatement projects by April 30 of each year.

Conclusions

EPA has made the preliminary determination that the effluent limitations and conditions in the Draft Permit will be protective of aquatic life, including shortnose sturgeon, Atlantic sturgeon, and designated critical habitat. Based on the analysis that all effects of the proposed action will be insignificant, we have determined that the reissuance of the Springfield WWTF NPDES permit is not likely to adversely affect any listed species or critical habitat under NMFS' jurisdiction. A more detailed analysis of the effluent limitations summarized above is provided in the Fact Sheet. During the public comment period, EPA has provided a copy of the Draft Permit and Fact Sheet to both NMFS and USFWS. We request your concurrence with this determination.

Sincerely,

David M. Webster

David M. Webster, Chief
Water Permits Branch
Office of Ecosystem Protection

cc: Christine Vaccaro, NMFS

Literature Cited

Auld, A.H. and J.R. Schubel. 1978. Effects of suspended sediment on fish eggs and larvae: a laboratory assessment. Estuarine and Coastal Marine Science 6: 153-164.

Bilotta, G.S., R.E. Brazier. 2008. Understanding the influence of suspended solids on water quality and aquatic biota. Water Resources 42: 2849-2861.

Cech J, J. Jr. and S.I. Doloshov. 2004. Environmental requirements, preferences, and tolerance limits of North American sturgeons. *In* Sturgeons and Paddlefish of North America, G.T.O. LeBreton, F.W.H. Beamish, R.S. Mckinley (eds.). pp 73-86.

Connecticut Department of Environmental Protection. 2000. A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound. Prepared by New York State Department of Environmental Conservation and Connecticut Department of Environmental Protection. December 2000.

Dadswell, M.J., B.D. Taubert, T.S. Squiers, D. Marchette and J. Buckley. 1984. Synopsis of biological data on shortnose sturgeon (*Acipenser brevirostrum*, LeSueur 1818). NOAA Tech. Rept. NMFS 14. 45 p.

Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.J. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. Fishery Bulletin 108:450-465. Available at http://greateratlantic.fisheries.noaa.gov/protected/atlsturgeon/references/dunton_et_al_2010.pdf

Kiørboe, T., E. Frantsen, C. Jensen, G. Sørensen. 1981. Effects of suspended sediment on development and hatching of herring (*Clupea harengus*) eggs. Estuarine, Coastal, and Shelf Science 13: 107-111.

Kynard, B. 1997. Life history, latitudinal patterns, and status of shortnose sturgeon. Environmental Biology of Fishes 48:319-334.

Kynard, B., M. Horgan, M. Kieffer, and D. Seibel. 2000. Habitats used by shortnose sturgeon in two Massachusetts rivers, with notes on estuarine Atlantic sturgeon: a hierarchical approach. Transactions of the American Fisheries Society 129: 487-503.

Kynard, B., P. Bronzi, H. Rosenthal. 2012. Life History and Behavior of Connecticut River Shortnose Sturgeon and other Sturgeons. World Sturgeon Conservation Society: Special Publication 4 (2012).

Massachusetts Department of Environmental Protection. 2003. Chicopee River Watershed 2003 Water Quality Assessment Report. Report No. 36-AC-3. October 2008.

Massachusetts Department of Environmental Protection. 2003. Connecticut River Watershed 2003 Water Quality Assessment Report. DWM Control Number CN 105.2.

Massachusetts Department of Environmental Protection. 2014. Massachusetts Year 2014 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. CN 450.1.

National Marine Fisheries Service. 2007. Biological Assessment of Atlantic Sturgeon *Acipenser oxyrinchus oxyrinchus*. Atlantic Sturgeon Status Review Team Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007 (updated July 27, 2007). 174 pp.

National Marine Fisheries Service. 2010. Biological Assessment of Shortnose Sturgeon *Acipenser brevirostrum*. Shortnose Sturgeon Status Review Team Report to National Marine Fisheries Service, Northeast Regional Office. November 1. 2010. 417 pp.

Secor, D.H. and T.E. Gunderson. 1998. Effects of hypoxia and temperature on survival, growth, and respiration of juvenile Atlantic sturgeon, *Acipenser oxyrinchus*. Fishery Bulletin 96: 603-613.

Secor, D.H. and J.E. Niklitschek. 2002. Sensitivity of sturgeons to environmental hypoxia: physiological and ecological evidence. In: Thurston, R.V. (Ed.), Fish Physiology, Toxicology, and Water Quality. Proceedings of the Sixth International Symposium, La Paz, Mexico. p. 61-78.

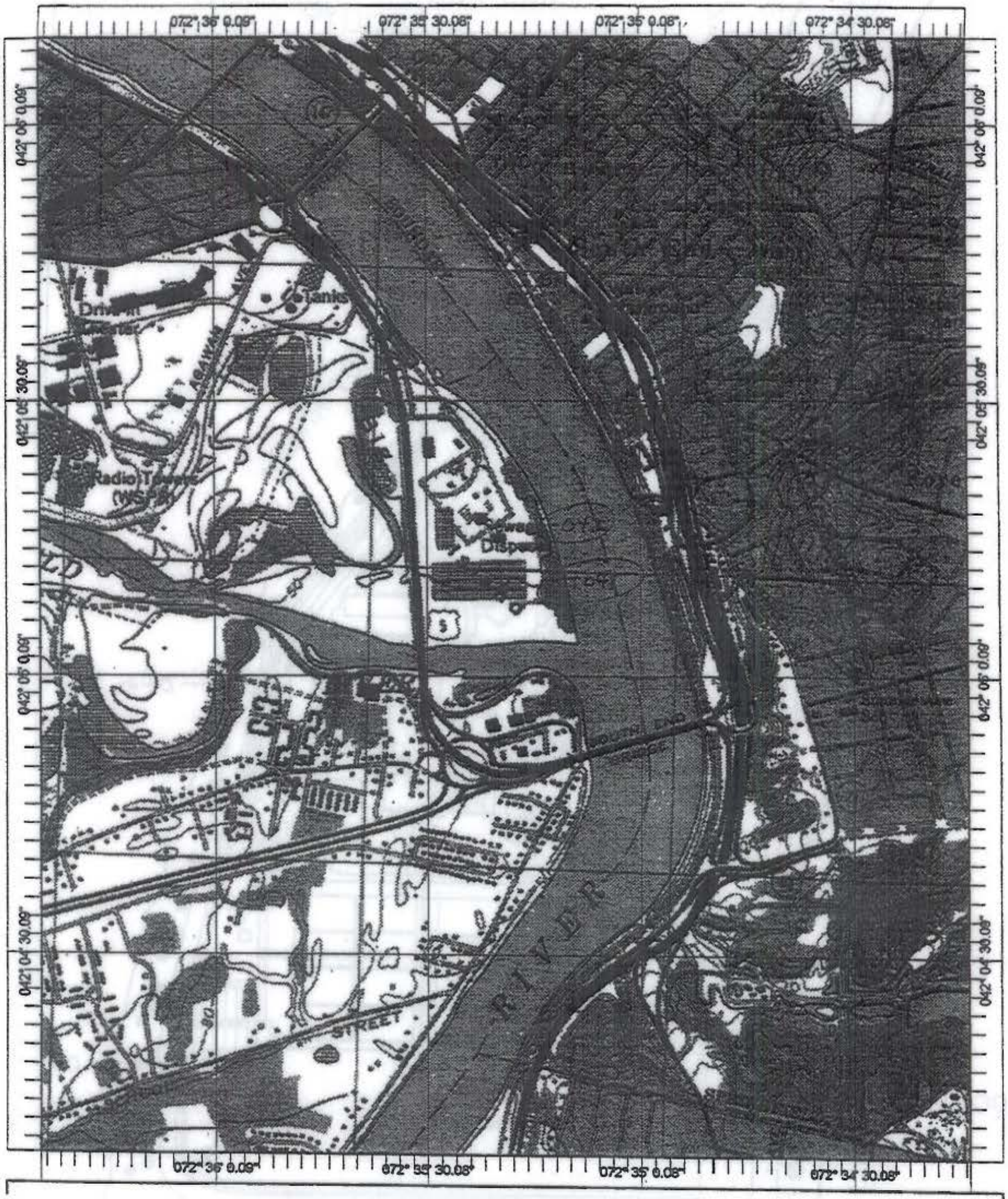
Stein, A.B., K.D. Friedland, and M. Sutherland. 2004. Atlantic sturgeon marine distribution and habitat use along the Northeastern coast of the United States. Transactions of the American Fisheries Society 133:527–537.

U.S. Environmental Protection Agency. 1986. Quality Criteria for Water. EPA 440/5-86-001. May 1986.

U.S. Environmental Protection Agency. 2004. Ambient water quality criteria for dissolved oxygen, water clarity, and chlorophyll a for the Chesapeake Bay and its tidal tributaries (2004 Addendum). EPA 903-R-03-002. October 2004.

EXHIBIT C

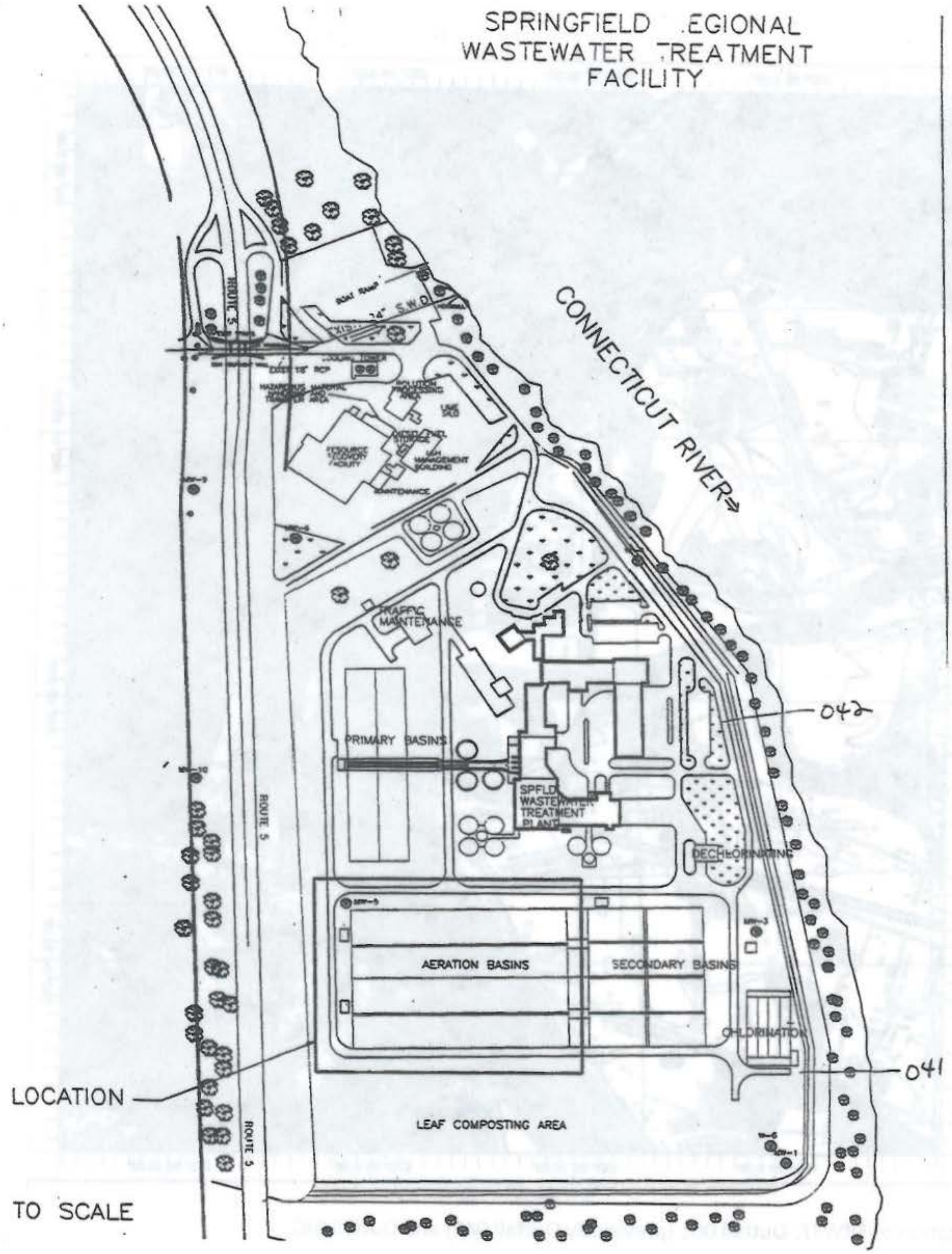
Attachment A
Site Location



Location of SRWTF, Outfall 001 (previously Outfall 041) and Outfall 042

EXHIBIT C

Attachment A
Site Location



Location of SRWTF, Outfall 001 (previously Outfall 041) and Outfall 042

EXHIBIT C

Attachment B

CSO overflow events, and volume (in 1,000's of gallons), as reported by SWSC

	2012		2013		2014		2015		2016	
Outfall	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume
7	2	0.3	1	83	2	941	6	550	3	450,773
8	37	65,573	7	20,903	0	0	11	14,446	2	380,020
10	32	43,179	37	74,458	47	77,494	34	48,446	36	34,047,622
11	41	86,026	4	68	4	475	1	0	4	208783
12	34	46,730	47	194,448	53	143,896	32	94,150	17	44,169,891
13	17	9,784	26	12,852	53	18,302	39	5,316	19	13,062,740
14	22	4,573	38	16,018	35	10,215	38	15,568	39	9,357,306
015A	42	9986	31	11,302	27	11,966	26	5,828	18	4,874,542
015B	0	0	9	379	11	844	6	83	1	3136
16	33	53,783	35	85,782	40	74,421	23	21,727	32	40,031,958
18	12	756	16	768	14	735	15	317	7	455784
49	13	1,639	15	1,873	25	2,486	24	4,104	11	482,649
17	13	1,635	22	1,779	18	2,616	17	1,404	7	67,851
19	17	18,650	7	8,258	9	2,150	4	8,857	3	1,142,252
24	9	448	7	1,258	9	392	7	254	1	21,126
25	11	1,241	18	2,231	18	1,342	10	534	13	1,377,830
45	15	268	24	696	19	1,545	12	670	6	1,491
46	20	1,813	23	2,425	18	3,316	10	1,293	6	618,669
48	10	4,957	12	530	16	1,319	15	6,355	11	439,059
34	14	1,648	21	4,848	21	1,278	12	841	10	61,447
35	22	2,146	11	1,754	11	2,462	10	726	5	337,987
37A	22	461	9	1,342	10	601	8	392	12	226,657
36A	24	3,680	14	3,160	17	3,485	14	2,310	5	1,327,395
042 at WWTF	10	5,532	11	4,307	16	16,313	12	6,878	8	6,435,000
CSO Total	472	361,510	445	451,522	493	378,594	386	241,049	276	159,581,968
WWTF Bypass	19	41,285	30	91,875	31	121,040	19	51,562	1	6,771,000

EXHIBIT C

Attachment B

CSO Outfalls Locations and Volumes

Outfall No.	Location	Latitude Longitude
To Connecticut River		
007	Rowland St.	42° 12' 72° 62'
008	Washburn St. 4	42° 11' 72° 62'
010	Clinton St.	42° 10' 72° 60'
011	Liberty St.	42° 10' 72° 59'
012	Worthington St.	42° 10' 72° 59'
013	Bridge St.	42° 10' 72° 59'
014	Elm St.	42° 10' 72° 59'
015A	Union St.	42° 10' 72° 59'
015B	Union St.	42° 10' 72° 59'
016	York St.	42° 09' 72° 59'
018	Longhill St.	42° 06' 72° 58'
049	Springfield St.	42° 10' 72° 62'
042	Bondi Island Treatment Plant	
To Mill River		
017	Fort Pleasant (Blake Hill)	42° 09' 72° 58'
019	Mill, Orange, & Locust Sts.	42° 09' 72° 57'
024	Rifle & Central Sts.	42° 10' 72° 56'
025	Allen & Oakland Sts.	42° 10' 72° 56'
045	Fort Pleasant Ave.	42° 06' 72° 58'
046	Belmont St.	42° 06' 72° 58'
048	Allen & Rifle Sts.	42° 10' 72° 56'
To Chicopee River		
034	Main St.	42° 16' 72° 51'
035	Front & Oak Sts.	42° 16' 72° 50'
036A	Pinevale & Water Sts.	42° 16' 72° 50'
037	Cedar St. 4	42° 16' 72° 50'

EXHIBIT C

Attachment B

EXHIBIT C

Attachment B