EXHIBIT 4

SPRINGFIELD WATER AND SEWER COMMISSION

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Established

1996

February 9, 2018

VIA EMAIL (timony.meridith@epa.gov, Claire.golden@state.ma.us)

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RE: DRAFT NPDES PERMIT COMMENTS
SPRINGFIELD WATER AND SEWER COMMISSION
SPRINGFIELD REGIONAL WASTEWATER TREATMENT FACILITY
NPDES PERMIT NO. MA0101613

Dear Ms. Timony and Ms. Golden:

The Springfield Water and Sewer Commission (SWSC) respectfully submits the enclosed comments on the draft National Pollutant Discharge Elimination System (NPDES) permit (Permit), dated November 15, 2017, for the Springfield Regional Wastewater Treatment Facility (SRWTF). Due to the significant impact the Permit will have on future compliance strategies, capital investment, and overall affordability, SWSC developed the detailed comments below in order to provide its full perspective to the permit finalization process. The Commission welcomes and appreciates any opportunity to work with EPA Region 1 to resolve the questions and issues identified in these comments prior to the issuance of the final permit.

Background

The Commission owns and operates both the SRWTF and the combined sewer collection system, which includes 23 combined sewer overflow (CSO) outfalls within the City of Springfield. Currently, the SRWTF is regulated by NPDES permit no. MA0101613 (issued February 1, 2001), and the CSOs are regulated under NPDES permit no. MA010331 (issued September 30, 2009). When finalized, NPDES permit MA0101613 will supersede the SRWTF NPDES permit currently in effect, and will also incorporate the regulation of 23 CSOs, thus becoming a combined permit.

SWSC also notes that in addition to the named permittee (SWSC), the draft permit is also issued to six co-permittees: the Towns of Agawam, East Longmeadow, Longmeadow, Ludlow, West

Springfield, and Wilbraham. It is SWSC's understanding that any support for these comments or additional input from the co-permittees will be issued in separate documents.

Comments Related to CSO and Wet-Weather Flow Issues

SWSC offers the following comments and proposed resolutions on the combined draft NPDES permit renewal MA0101613, which covers both the treatment facility and the CSO discharges:

1. **Co-Permittee:** The draft NPDES permit is issued to the SWSC, but also to the six towns identified above. While none of these towns own or operate a CSO (all CSOs are located in the City of Springfield), their collection systems contribute to a combined system, and all wastewater from the six municipalities eventually flows to the SRWTF for treatment and discharge (or overflows at a CSO in Springfield).

   The following concerns are noted:

   Lack of Legal Basis to Permit Satellite Communities:

   The Clean Water Act (the Act) does not authorize EPA to issue NPDES permits to the Satellite Communities, much less include them as co-permittees in the Draft Permit. The Act prohibits any person from discharging pollutants except in compliance with its permitting requirements:

   > Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.[1]

   EPA may issue permits for the discharge of pollutants, so long as the discharge complies with all applicable requirements:

   > Except as provided in sections 1328 and 1344 of this title, the Administrator may, after opportunity for public hearing issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311(a) of this title, upon condition that such discharge will meet either (A) all applicable requirements under sections 1311, 1312, 1316, 1317, 1318, and 1343 of this title, or (B) prior to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this chapter.[2]

   A discharge of pollutants that must be permitted is defined as follows:

   > The term "discharge of a pollutant" and the term "discharge of pollutants" each means (A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft.[3]

[1] 33 USC 1311(a).

[2] 33 USC 1342(a)(1).

[3] 33 USC 1362(12).

A point source from which pollutants are discharged is defined as follows:

> The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.[4]

Note that the structures that are considered point sources are defined in terms of singular items. They are not defined as, for example, a collection of such items that might make up a "POTW." EPA uses the "collection" concept in its memorandum discussing Satellite Communities that is attached to SWSC's Draft Permit (the EPA Region 1 NPDES Permitting Approach for Publicly Owned Treatment Works that Include Municipal Satellite Sewage Collection Systems ("the Region 1 Approach")). But that "collection" concept is not consistent with the CWA. An NPDES permit is required for the specific conveyance from which pollutants are discharged. In the case of the Draft Permit, those point sources are the enumerated outfalls for treated wastewater and CSO discharges, owned and operated by SWSC.

Similarly, the person to which the Act's permitting requirements apply for any particular discharge is defined in the singular:

> The term "person" means an individual, corporation, partnership, association, State, municipality, commission, or political subdivision of a State, or any interstate body.[5]

Thus, the discharge of any pollutant to navigable waters from any point source by any person is prohibited except in compliance with the Act. None of the applicable terms specifically contemplated multiple permittees responsible for a single discharge.

However, the possibility of separate ownership and operation of a particular point source is contemplated. In that instance, a single person is responsible for obtaining the necessary permit:

> Who applies? When a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit.[6]

The grants portion of the Act is structured similarly. Despite the fact that a particular POTW can encompass many tributary and supporting structures,[7] the Act contemplates granting construction funds to a single entity:

> The Administrator shall not make grants from funds authorized for any fiscal year beginning after June 30, 1974, **to any State, municipality, or intermunicipal or interstate agency** for the

[4] 33 USC 1362(14); 40 CFR 122.2.

[5] 33 USC 1362(5).

[6] 40 CFR 122.21(b).

[7] 33 USC 1292(2).

> erection, building, acquisition, alteration, remodeling, improvement, or extension of treatment works unless the grant applicant has satisfactorily demonstrated to the Administrator that—[8]

Nowhere does the Act specifically contemplate issuing either permits or grants to more than one person for a single POTW or a single discharge.

In fact, the Act explicitly recognizes that a POTW could serve multiple communities, whose collection systems are not part of the permitted POTW:

> The Administrator shall not approve any grant after July 1, 1973, for treatment works under this section unless the applicant shows to the satisfaction of the Administrator that **each sewer collection system discharging into such treatment works** is not subject to excessive infiltration.[9]

Thus, contrary to assertions contained in the Region 1 Approach, a satellite community's collection system does not automatically become a part of the POTW to which it connects for the purpose of conveying wastewater to a regional treatment plant. Nor does that satellite community become a person responsible for the discharge of pollutants from that POTW by the mere fact of its connection. Only the owner/operator or, if different, the operator of the POTW is responsible for obtaining and complying with an NPDES permit related to that discharge.

Congress could have provided for single permits to cover multiple collection systems in the NPDES program, but did not. In contrast, the Act does provide for such permits in the stormwater program:

> Municipal discharge. Permits for discharges from municipal storm sewers—
>
> (i) may be issued on a system- or jurisdiction-wide basis[10]

In the absence of clear authority in the NPDES portions of the Act, EPA cannot presume such authority exists.

As a result, the Region 1 Approach is not supported by the Act, and the Satellite Communities should not be included as co-permittees in the Draft Permit. SWSC recognizes that the Region 1 Approach has been upheld by the Environmental Appeals Board.[11] However, that opinion has not been subject to judicial review, and Springfield believes that the Region 1 Approach should be determined to be unauthorized and the EAB reversed.

It appears that even EPA does not consider the Satellite Communities to be dischargers for purposes of the entire Act. For example, the Draft Permit does not require the Satellite Communities to comply with all provisions of the Act—only Parts I.C, I.D, and I.E apply—

[8] 33 USC 1281(g)(2) (emphasis added).

[9] 33 USC 1281(g)(3) (emphasis added).

[10] 33 USC 1342(p)(3)(B); *see also* 40 CFR 122.33.

[11] *In re Charles River Pollution Control District*, NPDES Appeal No. 14-01 (EAB Feb. 4, 2015).

despite the Act's requirement that permittees be required to comply with all permitting provisions.[12] Further, EPA seems to go to great lengths to justify treating the Satellite Communities as co-permittees for purposes of the Draft Permit. This implies that in some circumstances, EPA would not treat all satellite communities to a particular POTW as co-permittees. This ignores the fact that the Act's permitting requirements are not discretionary. If all satellite communities are dischargers, then all satellite communities must obtain NPDES permits and be subject to all NPDES permitting requirements. If not, then the Region 1 Approach is not supported by the Act.

Following the Region 1 Approach leads to some unintended consequences that EPA apparently has not considered. Examples include:

a) Inconsistency in Co-Permittee Requirements: The draft permit page 1 of 24 states:

*"…are co-permittees for **Part C**, Unauthorized Discharges; **Part D**, Operation and Maintenance…and **Part E**, Alternate Power."*

However, the Fact Sheet page 5 of 34, Part I, paragraph three states:
*"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."*

b) Liability: The draft permit page 1 of 24 states*: "The permittee and each co-permittee are severally liable under Part C, Part D and Part E for their own activities and required reporting with respect to the portions of the collection system that they own and operate. They are not liable for violations of Part C, Part D and Part E committed by others relative to the portions of the collection system owned and operated by others. Nor are they responsible for any reporting that is required of other permittees under Part C, Part D and Part E."*

The issue of liability for violations of the permit when such a permit is issued to multiple entities is a concern. An example would be if the SRWTF experiences an unauthorized bypass due to excessive flows. Which of the six named co-permittees would be held responsible for causing or contributing to that discharge? What if CSO discharges increase at a particular location over time? Would the permittee, a co-permittee, or combination of co-permittees be responsible?

c) Unauthorized Discharges: On page 13 of 24, Part C, the draft permit states:
"The permittee and co-permittees are authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfalls listed in Part I.A.1 and Part I.B.1 of this permit."

While the above language is common to NPDES permits across the country, of concern in this permit is the inability to clearly identify liability with a single permit issued to seven entities (SWSC and six co-permittees).

For example, it is our understanding that discharge location 042 has historically been treated as an emergency bypass, and we will request that it continue to be treated so. However, if the U.S. Environmental Protection Agency (EPA) fails to

[12] 33 USC 1342(a).

grant an affirmative defense for its use, SWSC may be subject to fines and penalties, yet the cause of the unpermitted discharge is excessive flows [perhaps due to illegal cross-connections between storm drain and sanitary sewer systems, failure to implement inflow and infiltration (I/I) control, etc.] from any one or more of the six co-permittees.

In addition, it is not clear that DOJ would be empowered to enforce violations of the Draft Permit by any of the Satellite Communities. Recent guidance issued by the Associate Attorney General prohibits DOJ from using its enforcement authority to effectively convert agency guidance documents into binding rules.[13] In the absence of statutory or regulatory authority requiring issuance of permits to every satellite community that connects its collection system to a POTW, the Region 1 Approach is simply a guidance document, which cannot be legally enforced.

Request: EPA must consider removing the co-permittees from this permit and seeking other means to regulate the upstream towns. If that is not possible, EPA must clarify if the co-permittees are responsible for Part C, Part D and Part E, or are only responsible for Parts C and D; critically examine language regarding liability and modify it to limit SWSC's liability for non-compliance with the permit related to co-permittees; and clarify the liability of co-permittees for hydraulically connected systems.

2. **Blending:** SWSC has identified several concerns related to the discussion of a secondary bypass (blending) as described below:

   a) Cutoff Flow for Bypass of Secondary Treatment: The draft permit page 3 of 24 states: *"A bypass of secondary treatment is allowed when wet weather flow exceeds the wet weather capacity of the secondary treatment."* SWSC is concerned that the "wet weather capacity of the secondary treatment" is not defined, and is left open to interpretation. SWSC is aware that the draft Fact Sheet states: *"The Facility has the capacity to provide...secondary treatment for flows up to 134 MGD."* However, the facility operator will likely need to make a determination to bypass secondary treatment based upon peak hourly flow or some measure other than an average daily flow volume (which cannot be determined until the day has concluded). This leaves the permittee open to a violation and/or penalties due to the interpretative nature of the bypass language. Furthermore, future changes in plant processes to meet the regulatory requirements will continue to inform changes in how the bypass is initiated.

      Request: Modify the language to read: *"A bypass of secondary treatment is ~~allowed~~ authorized when peak wet weather flow exceeds the wet weather capacity of the secondary treatment."*

   b) DMR Reporting Requirements: The draft permit page 5 of 24, footnote 3, requires that the SRWTF record the date, time, and "total influent flow" at time of initiation and termination of the bypass. The permit does not define "total influent flow" or the mechanism for its measurement.

[13] *Memorandum Limiting Use of Agency Guidance Documents in Affirmative Civil Enforcement Cases,* Associate Attorney General (Jan. 25, 2018).

Request: EPA must define "total influent flow" as either the instantaneous flow at the time of measurement, or the total flow received on a calendar day up to that point.

c) Blending Is Considered Non-Compliance: The draft permit page 5 of 24, footnote 3, states: *"A bypass of secondary treatment also is subject to the requirements of Part II.B.4.c and Part II.D.1.e of this permit."*

Part II.B.4.c refers to an unanticipated bypass, for which notification in accordance with II.D.1.e must be submitted. Notification requirements are necessary for *"any non-compliance which may endanger health or the environment. This section requires not only 24-hour reporting, but a written submission which details the cause of the non-compliance, and steps taken to reduce, eliminate and prevent reoccurrence of the non-compliance."*

Blending after primary treatment during high flow events was part of the original plant design to maximize the amount of flow it can treat. It is of particular concern that each time SWSC initiates blending of primary and secondary treated flows, it is considered "non-compliance." Not only does this expose the Facility to fines and penalties from the EPA, it also exposes the SRWTF to third party lawsuits. Additionally, it is perplexing why EPA is choosing to identify blending at this facility as a non-compliant event, when in the Fact Sheet page 8 of 34, EPA states: *"At this time, there(sic) no feasible alternatives to this bypass have been identified without the discharge of additional untreated sewage in the system's CSOs."*

Note that in accordance with the EPA 1994 Combined Sewer Overflow Control Policy 59 Fed. Reg. 18,688 (Apr. 19, 1994) (National CSO Policy), Section II.C.7 "Maximizing Treatment at the Existing POTW Treatment Plant," a facility may be authorized to allow a CSO-related bypass of secondary treatment without the need to provide approval on a case-by-case basis, where it can be shown that the facility has completed a No Feasible Alternatives Analysis in accordance with this section.

Specifically, EPA's National CSO Policy clearly indicates that a permit may "define the specific parameters under which a bypass can legally occur," and further states:

> Under this approach, EPA would allow a permit to authorize a CSO-related bypass of the secondary treatment portion of the POTW treatment plant for combined sewer flows in certain identified circumstances.

59 Fed. Reg. at 18,693 (emphasis added). The Clean Water Act (CWA) requirement that "each permit…for a discharge from a municipal combined storm and sanitary sewer shall conform to" the CSO Policy provides statutory authority for issuance of permits authorizing peak wet weather discharges consistent with the National CSO Policy. CWA 402(q)(1), 33 USC 1342(q)(1).

Further, EPA's own guidance documents support the authorization of a CSO-related bypass. Combined Sewer Overflows Guidance for Permit Writers (EPA 832-B-95-008, Sept. 1995) (CSO Permit Writers Guidance). That document has never been withdrawn by EPA, and provides the following example permit language for authorized CSO related bypasses:

> A CSO-related bypass of the secondary treatment portion of the POTW treatment plant is authorized when the flow rate to the POTW treatment plant is as a result of precipitation event exceeds [insert flow rate in MGD]. Bypasses that occur when the flow at the time of the bypass is under the specified flow rate are not authorized under this condition and are subject to the bypass provision at 40 CFR 122.41(m).

Finally, it is important to note that new requirements proposed by EPA for the secondary bypass reflects a substantial change in the regulatory requirements that are imposed on NPDES dischargers, which are proposed to be imposed without following any of the procedures required before such a change can be made. The U.S. Court of Appeals for the D.C. Circuit has held as follows:

> Once an agency gives its regulation an interpretation, it can only change that interpretation as it would formally modify the regulation itself: through the process of notice and comment rulemaking.

Alaska Professional Hunters Assoc. v. Federal Aviation Admin. 177 F.3d 1030, 1033-34 (D.C. Cir. 1999), quoting *Paralyzed Veteran of America v D.C. Arena*, 117 F.3d 579, 586 (D.C. Cir. 1977).

Since the Fact Sheet identifies that there are "no feasible alternatives" to the secondary bypass, clearly SWSC is authorized under this permit to operate a secondary bypass. Therefore, the event should not be identified as a "non-compliant" event (since it is clearly authorized) and reporting requirements under II.D.1.e should also not be required.

Request: EPA must clearly identify the bypass of secondary treatment under the circumstances described in the permit as an authorized bypass in accordance with the National CSO Policy Section II.C.7, and remove those sections of the permit that identify this treatment process as non-compliant with the permit.

If EPA will not authorize a secondary bypass under this permit, the SWSC should be given the opportunity to provide a No Feasible Alternatives Analysis. If the secondary bypass is not ultimately explicitly stated as being compliant with the permit, SWSC may be forced to discontinue bypassing under high-flow conditions, which could result in the overall treatment process being compromised so that a poorer quality effluent is discharged, or additional untreated flows will be bypassed at 042, or in upstream CSOs. SWSC believes it is environmentally beneficial to provide at least partial treatment (through blending) rather than no treatment at all, but if the secondary bypass is regulated as an unauthorized bypass, SWSC will need to reevaluate this practice.

d) New Metering Location: On page 5 of 24 of the draft permit, footnote 3 states: *"The following information shall be reported and submitted as an attachment to the monthly DMRs for each day there was a bypass of secondary treatment: date and time of initiation, total influent flow at time of initiation, date and time of termination, total influent flow at time of termination, total duration of flow, and total volume of flow…"* Sub footnote a also states: *"Flows shall be measured using a meter."*

While the SWSC does not object to providing information on the DMRs relative to date, time and instantaneous flow recordings at the initiation and termination of the secondary bypass, SWSC does not believe that metered readings of the flow volume in the secondary bypass line is warranted given the extreme rarity of plant bypasses, the level of effort that would be required to accomplish this request, and the lack of a regulatory need to require internal plant metering of such flows.

For example, in 2017, there was only one secondary bypass that lasted 1.7 hours. Given the estimated bypass flow of 3.5 million gallons and the fact that the SRWTF accepted 12.94 billion gallons of flow over the course of 2017, the bypassed flow represented less than 0.03% of total plant flow. Coupled with this infrequent use of the bypass, the physical conditions that exist at the plant would make installing a meter extremely difficult in the bypass line. This would be a very expensive effort to obtain a flow reading once or twice a year.

Note that the quantity of secondary bypass flows can be estimated by SWSC, and SWSC would be willing to provide data as a calculated determination, rather than a metered determination.

Request: Please clarify that "total influent flow" refers to instantaneous flow at the time of initiation and termination of the secondary bypass. In addition, SWSC requests that secondary bypass flow not be required to be metered and instead be calculated as described above.

e) New Sampling Location: In the draft permit page 5 of 24, footnote 4 states: *"All required effluent samples shall be collected at a representative point following treatment and the comingling of secondary effluent with flows which bypass secondary treatment…"*

While SWSC does not object to taking all required effluent samples of the comingled flow, the requirement to utilize these samples to determine compliance is a new requirement, and SWSC has very limited data to determine compliance relative to plant flows and operations. Therefore, SWSC requests a compliance schedule of 18 months prior to this sampling location being used for purposes of compliance. This will enable SWSC to have an opportunity to sample the comingled flows for a period of 12 months over a variety of flow and weather conditions, and to then provide time for an engineering analysis to determine what, if any, plant operations need to be modified to ensure that NPDES permit effluent limitations will be met at all times, including during secondary bypass.

Request: Provide an 18-month compliance schedule so that SWSC can evaluate sampling data after comingling for the purpose of permit compliance.

3. **Reclassification of Outfall 042 from an Emergency Plant Bypass to a CSO:** Throughout the draft permit, existing emergency plant bypass outfall 042 has been re-defined as a CSO. This is of significant concern to SWSC, as the reclassification of this outfall will result in unnecessary expenditures and no environmental or water quality benefit, and will, in fact, provide less regulatory oversight than is currently the case.

The following concerns are noted:

a) Regulatory Basis Not Provided: The currently effective permit for the SRWTF (issued in 2001) as well as the currently effective CSO permit (issued in 2009) both identify the Springfield system as having 23 CSOs, which does not include discharge 042. Permit MA0101613 specifically states: *"This permit only authorizes the discharge from the outfall listed in Part I.A.1 of this permit. Discharges from CSOs are authorized by NPDES permit MA010331."* Yet, NPDES permit MA010331 does not identify 042 as a CSO.

   The regulatory basis in the draft permit provided in the Fact Sheet on page 27 of 34 is as follows: *"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.*"

   This Fact Sheet basis to support the regulatory change is clearly insufficient and fails to address the following:

   - The permitting history of 042 needs to be clearly identified from the earliest permit where 042 was first identified to present time. The history needs to include how 042 was identified in each historical permit (i.e. as a bypass), the method SWSC was required to use to report each use (EPA Bypass Provisions), and all previous written communication EPA, MassDEP and SWSC had in regard to the bypass. EPA needs to define the legal basis of status change of this outfall.

   - EPA needs to provide an adequate and defensible basis and background detailing the regulatory basis for the reclassification of this outfall. Simply stating that it was reclassified "for completeness" is insufficient. The EPA Permit Writers Manual Section 11.2 states that a Fact Sheet shall provide a basis to substantiate permit decisions and provide a sound basis for the derivation of permit terms, conditions, and limitations if challenges are made. Clearly, the Fact Sheet in this circumstance has failed to do so.

b) Outfall 042 Does Not Meet the EPA Definition of a CSO: CSOs are defined in the National CSO Policy, Section 1.A:

   "A CSO is the discharge from a CSS at a point prior to the POTW Treatment Plant."

   The term CSS is defined in this same document: *"A combined sewer system (CSS) is a wastewater collection system owned by a State or municipality (as defined by section 502(4) of the CWA) which conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and storm water through a single-pipe system to a Publicly Owned Treatment Works (POTW) Treatment Plant (as defined in 40 CFR 403.3(p))."*

   As shown in the Attachment A "Plant Flow Diagram," combined flows from the City of Springfield and customer communities enter the POTW Plant Inlet Structure, where preliminary mixing occurs prior to the 042 emergency plant bypass. Inasmuch as overflow 042 is clearly not "at a point prior to the POTW Treatment Plant" but is, in fact, after flows enter the POTW Treatment Plant Influent Structure,

overflow 042 is correctly identified as an emergency plant overflow, and not a CSO. In addition, Emergency Bypass 042 acts as a "plant protection line" during high flows, to prevent overloading of the treatment plant.

~~c)~~ EPA Recognizes 042 as an Emergency Plant Bypass: EPA currently, and historically, recognizes outfall 042 as a POTW emergency bypass and not as a CSO. Since issuance of SWSC's current NPDES permit in 2001, the SWSC has notified the EPA of each and every use of outfall 042, in accordance with the emergency plant bypass procedures at Part II, B.4(b) of its current permit, which would not be required if the overflow were a CSO. EPA never responded to SWSC that the Emergency Bypass Notifications were not necessary (which would be the case if EPA viewed the bypass a CSO).

At no time did EPA notify the SWSC that reporting of emergency bypass 042 was not necessary, as would be the case for a CSO.

d) Identification of 042 as an Emergency Plant Bypass in the Long Term Control Plan (LTCP) and Integrated Wastewater Plan (IWP): On May 30, 2012, the SWSC submitted to the EPA Region 1 a LTCP developed in coordination with both EPA and the Massachusetts Department of Environmental Protection (MassDEP). This IWP has subsequently been reviewed by EPA, and EPA determined the submittal met all regulatory requirements.

The IWP clearly identifies 042 as a plant emergency bypass. The IWP never identifies 042 as a CSO, and in fact, the IWP provides a detailed plan for addressing the plant overflow leading toward reduction of overflows based on the typical year model.

Section 6.8.4.4 of the IWP states: *"The selected SRWTF alternative is Alternative 3 with an estimated capital cost of $2,010,000. This alternative provides the most cost effective solution for controlling discharges at Bypass 042 in conjunction with implementation of a collection system hybrid alternative. Alternative 3 requires the incoming flow to the SRWTF to be limited to 180 MGD, and utilization of step-feed mode during storm events. This creates a potential need for a wastewater storage facility at the SRWTF if flows to the facility cannot be limited upstream of the river crossing."*

Section 2.2 page 2-3 of the IWP states: *"It should be noted that the overflow at the SRWTF is designed as Bypass 042 and is not considered part of the CSO regulator system."*

In addition to the above two noted circumstances, the 042 emergency bypass is referred to as a bypass separate and distinct from CSO identification an additional 29 times throughout the IWP.

Since the SWSC's ultimate goal is to reduce the use of the emergency bypass as determined on a typical year (except for extreme events that would quality for an affirmative defense) by limiting flows to the plant to 180 MGD, and is committed to the understanding that the cost involved will be in excess of $2M, there is no environmental, regulatory, or economical advantage for EPA to re-classify this outfall as a CSO.

Furthermore, at this time SWSC is not requesting that flows through 042 be authorized (as they would be under the CSO permit), as such a request would only perpetuate the use of 042 far into the future, with less regulatory oversight than currently is the case as an unauthorized bypass.

While SWSC recognizes that identification as a CSO involves alternative compliance requirements than a plant bypass, since SWSC's ultimate goal is to limit flows to the plant under 180 MGD at this time (the ultimate wet-weather capacity of the headworks and primary clarifiers), in which case expenditures associated with classifying 042 as a CSO would be no longer be necessary, these alternative compliance requirements would not represent an appropriate expenditure and use of ratepayer funds.

Request: SWSC requests that the final permit continue to identify 042 as an emergency plant bypass, and that all sections of the permit and the administrative record be revised as such including but not limited to all sections of the permit that refer to 24 CSOs (revise to 23). The Fact Sheet pages 2 and 27 of 34 also references 24 CSOs, and on page 5 of 34 the Fact Sheet references 25 CSOs. Please revise the permit and the administrative record to reflect 23 CSOs.

4. **Public Notification Plan:** The draft permit Part B.f. contains new, detailed requirements for SWSC to install and maintain signs at all CSO outfall structures, specifying the exact size, color, languages, and wording of the signs. In addition, the draft permit requires SWSC to develop a public notification plan, and specifies that SWSC has to provide notification of every CSO discharge when it occurs, and when it ends, both electronically to interested parties and on its website. The information to be provided includes volume of the CSO discharge.

   SWSC objects to these new requirements, which will result in substantial added costs to SWSC and its ratepayers without any added protection for public health, and requests that EPA provide us the legal authority to specify these requirements. Under the National CSO Policy, EPA provides that one of the Nine Minimum Controls (NMCs) is *"public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts."* SWSC has a plan currently that provides that notification, and EPA has never made any determination that the current plan does not meet the CSO policy requirements. The new requirements in the draft permit go well beyond the NMC provision, and should be deleted from the draft permit.

   The above notwithstanding, SWSC offers the following specific comments:

   a) Public Notification Plan Contents: The draft permit requires that:

      "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)."

Furthermore:

"Subsequently, within 24 hours of the termination of any CSO discharge(s), the permittee shall provide the following on their website and in a follow-up electronic communication to any interested party: CSO number and location, Confirmation of CSO discharge, Total volume discharged from the CSO, and Date, start time and stop time of the CSO discharge."

These requirements are excessive, go far beyond EPA's published requirements, and are costly, and the requirement to monitor flow volume is simply not consistently implementable.

In EPA's Combined Sewer Overflows Guidance for Nine Minimum Controls, Chapter Nine contains specific guidance for the implementation of this NMC measure, as follows:

- Section 1-7 specifically states that, *"The NMC are controls that…do not require significant engineering studies or major construction, and can be implemented in a relatively short period…"*

- Section 9-1: *"The intent of the eighth minimum control, public notification, is to inform the public of the location of the CSO outfalls, the actual occurrences at CSOs, the possible health and environmental effects of CSOs, and the recreational and commercial activities…curtailed as a result of CSOs."*

  No meaningful interpretation of this language would conclude flow volume or duration should be required. Further, as detailed in comment #9 below, flow measurement of volume and duration is not feasible to implement for the purposes of CSO reporting.

- EPA NMC guidance provides specific examples of control measures under public notification which are:

  - Posting at affected use areas (SWSC will consider this in the plan)
  - Posting at selected public places (SWSC will consider this in the plan)
  - Posting at CSO outfalls (SWSC has completed this)
  - Notices in newspapers, radio, TV news programs, letters to residents, telephone hotline (SWSC is proposing a website notification described further below)

The requirements of flow duration, and starting and stopping times, go far beyond any controls EPA considered in the NMC guidance. These requirements are, in fact, IWP characterization requirements, not appropriate for inclusion in a NMC public notification plan. SWSC strongly objects to their inclusion as part of the public notification plan.

As part of our public notification plan, SWSC is considering, the development of a website to provide predicative CSO activation notification to the public. This website would provide 24/7 notification to the public regarding which CSOs are

active. CSO notifications and updating of the website would be accomplished electronically with the use of a model and rainfall measurement. By use of the model with automatic, electronic website updating, the public can access immediate and meaningful information regarding the status of the SWSC CSO discharges into the Connecticut River, Chicopee River, and Mill River, and may then make appropriate decisions regarding access to the waterbodies at that time.

This system has been successfully implemented in a number of CSO communities outside of Massachusetts, and has been favorably received by the public, environmental groups and regulated entities.

b) Public Notification Plan Submittal Deadlines: The draft permit requires the submission to EPA of a public notification plan within 90 days of the effective date of the permit, and implementation within six months of the effective date of the permit.

SWSC considers the development of a meaningful public notification plan to be one of our highest priorities. Not only will the SWSC develop a plan that meets the requirements of the National CSO Policy and NMC guidance documents, but SWSC intends to solicit input from the City of Springfield and the surrounding communities in the six co-permittee municipalities. A public notification plan will only be meaningful to the extent that it addresses the needs of the community.

Further, so as to not unnecessarily delay implementation of the public notification plan, SWSC requests that development of the plan and implementation be combined into one activity, as was previously approved by EPA. In this example, all New Jersey CSO owners and appropriate communities (210 CSOs within 26 communities) are required to develop and implement a public notification plan within 36 months of the effective date of their permit. The public notification plan has been re-named the public notification report, to reflect that at the time of submittal of the report (36 months from the effective date of the permit) the public notification plan will already be implemented, and the report can include a discussion of the current operations, public comments and ability to meet the needs of the community.

In order to provide the necessary time to develop a meaningful plan, solicit appropriate input, determine the content and extent of appropriate notification, develop a web-based notification system that integrates the use of our existing model with four strategically located rain gauges, evaluate public posted signs and need for additional public postings, plus other contents of a meaningful public notification plan, SWSC requests that the submittal requirements of this permit reflect the submittal requirements approved under EPA Regions II – namely submittal of a public notification report within 36 months from the effective date of the permit.

5. **Annual CSO Report:** In the draft permit, page 13 of 24, Section I.B.4, it states: *"The permittee shall submit a report summarizing the activities during the previous calendar year relating to compliance with the nine minimum controls including the required information on the number of activations for each CSO as well as the volume of each discharge from each CSO."*

The SWSC objects to the inclusion of this requirement for the following reasons:

- As discussed in further detail under comment #9 below, "Quantification of CSO Discharges," the requirement to report the volume of CSO discharge is beyond the regulatory scope of the NMCs, and therefore has no regulatory basis to be included in this permit.

- The number of activations of each CSO will already be reported monthly on each DMR.

- CSO and related inspection records can be kept onsite and inspected by EPA and MassDEP at any time, or submitted at any time.

- All dry-weather overflows (DWO) are already reported to EPA within 24 hours of SWSC becoming aware of an occurrence.

- SWSC has requested a timeline for the submittal of the public notification plan. SWSC anticipates that progress reports will be associated with this timeline.

Inasmuch as the above "activities during the previous calendar year relating to compliance with the nine minimum controls" are satisfactorily addressed without the submission of an additional annual report, SWSC requests this report requirement be eliminated.

Request: Remove requirement I.B.4 Annual CSO Report from the draft permit.

6. **Solids and Floatables Removal:** Solids and floatable removal is required in permit sections Part I.B.2 (6) (page 10 of 24) and Part I.B.3.C (page 11 of 24). Should EPA continue to classify outfall 042 as a CSO, SWSC will require sufficient time to install this technology.

   Request: A timeline must be provided to SWSC to allow three years from the effective date of the permit to provide sufficient time to install solids and floatables control on any newly defined CSOs (i.e., outfall 042, should EPA continue to classify it as a CSO).

7. **NMC Documentation:** In section I.B.3.a, the permit states: *"The permittee must implement the nine minimum controls in accordance with the documentation provided to EPA and MassDEP or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the following controls plus other controls the permittee can reasonably undertake as set forth in the documentation."*

   SWSC understands that as a CSO permittee, it must comply with the NMC requirements of the National CSO Policy. However, the draft permit states that requirement in a way that improperly adds to what is required under the policy.

   The parts that are underlined above have no legal authority. The NMC are clearly laid out in the CSO policy, but here EPA appears to be adding to them, and to be doing so in a vague way, leaving SWSC to guess at what additional steps are required to comply. The first underlined term, "or as subsequently modified to enhance the effectiveness of the controls," seems to imply that SWSC has some obligation to "enhance the effectiveness" of the steps that it is taking to meet the NMCs. Beyond the fact that "enhance the effectiveness" is a vague term that is defined nowhere in the permit or in EPA regulations

or guidance, EPA has no authority to require this. Similarly, the concept of "other controls the permittee can reasonably undertake" is completely undefined and vague, and EPA has no legal authority to require SWSC to take any such steps. Both of the underlined clauses should be deleted from the permit language.

SWSC requests that EPA provide a description of "the documentation provided to the EPA and MassDEP." Once this documentaiton is identified, the SWSC requires an opportunity to review the contents and determine whether implementation of the NMCs is appropriate and feasible with respect to its contents.

The second sentence of paragraph 3.a. states: *"must include the following controls…"* Please note that there are no additional items following this statement, or as a subset of Part 3.a.

Finally, SWSC cannot agree to implement the NMCs in accordance with documentation that may be "subsequetly modified" (in documentation which is yet to be identified). SWSC is not in a position to confirm, prior to having the opportunity to review any future modifications, that the modifications are feasible, attainable or technically appropriate.

Request: SWSC requests that EPA delete the underlined clauses in this language ("or as subsequently modified to enhance the effectiveness of the controls" and "plus other controls the permittee can reasonably undertake"). Please specifically identify the "documentation provided to EPA and MassDEP," and identify "the following controls" or remove the sentence; allow SWSC an opportunity to examine and comment on "the documentation provided to EPA and MassDEP" prior to its inclusion in a final permit; remove references to compliance with future (unseen) modifications.

8. Monthly Inspection Requirement: In section I.B.3.b, the permit requires that each CSO structure/regulator, pumping station, and/or tide gate be inspected at least monthly to ensure they are in good working condition and adjusted to minimize combined sewer discharges.

The following concerns are noted:

a) Not all of the items noted above are accessible. For example, some of the outfalls are submerged, and some of the regulators are not accessible.

b) "Adjusted to minimize combined sewer discharges" is vague language and not implementable. How would this level be determined? Also, there are circumstances when flows discharged from the CSO should not be minimized, such as a downstream sewer break, equipment failure, severe weather that would otherwise cause backups in the system, times when flow to the SRWTF must be limited, or other such occurrences when the ability to discharge increased flows through a CSO is necessary in order to protect human health and prevent upstream SSOs and back-ups into homes and businesses.

Request: SWSC requests that the inspection requirement section be modified as follows: "To the extent feasible, each accessible CSO structure/regulator, pumping station, and/or tidegate shall be routinely inspected, at a minimum of once per month, to insure that they are in good working condition and adjusted so as to perform at the level and function intended."

9. <u>Quantification of Discharges through CSOs:</u> Section I.B.3.e. of the draft permit contains specific records which must be kept regarding quantifying the flows from all CSOs, including hours of discharge, volume in gallons of discharge, National Weather Service precipitation data, and cumulative precipitation per discharge event.

The following comments are offered:

a) SWSC objects to the extensive and over-reaching nature of EPA's determination of NMC number 9: "Monitoring to effectively characterize CSO impact and the efficacy of CSO controls."

While recording CSO events is necessary to comply with the NMC policy, additional data collection such as hours of discharge, volume of discharge, and the National Weather Service precipitation data will result in excessive costs to SWSC, and are requirements that go far beyond those necessary to comply with the NMC, which EPA has repeatedly qualified as "low cost measures."

Section 1-7 of the NMC guidance document specifically states that, *"The NMC are controls that…do not require significant engineering studies or major construction, and can be implemented in a relatively short period…"*

While EPA may have required the extensive monitoring in this draft permit with the mistaken assumption of continuous flow metering being present, please know that flow meters currently installed in the Springfield collection system are temporary in nature, and are used solely to characterize flows throughout the system to inform and calibrate the models used for the IWP implementation. EPA recognizes that flow metering is a component of the IWP characterization, and not a requirement of the NMC (see NMC guidance document page 10-1: *"This minimum control is the precursor to the more extensive characterization and monitoring efforts conducted as part of the LTCP…"*)

The placement of these flows meters was not intended to accurately measure each and every overflow event at each of the individual 23 CSO locations, but rather their placement was specific to the modeling and analysis required under the IWP. The contract covering the use of the flow meters will expire October 2020, and most of the flow meters are anticipated to be removed at that time.

Since flow metering within the Springfield system will be shortly discontinued, and the continued use of flow meters would be an excessive and burdensome cost, SWSC requests that CSO monitoring be required in the manner that is prescribed in the NMC guidance document.

Specifically, EPA guidance as detailed in the NMC guidance document prescribes the following levels of monitoring as being in compliance with the National CSO Policy:

- Page 10-1: *"The ninth minimum control involves visual inspection and other simple methods to determine the occurrence and apparent impacts of CSOs."*

- Page 10-2: *"The municipality should record the number of CSO overflows at as many outfalls as feasible…Large systems should work with the NPDES permitting authority to select a percentage of outfalls that represent the entire drainage area and sensitive locations."*

- Page 10-2: *"Monitoring of flow and quality at the level necessary to calibrate models and/or estimate pollutant loadings is addressed in EPA's…'Combined Sewer Overflows-Guidance for Long Term Control Plan' and may be beyond the intended scope of minimum control monitoring." (emphasis added).*

- Page 10-2: *"In cases where a calibrated model of the CSS exists (or when one becomes available) model projections may be used to determine the frequency and location of overflow events."*

- Page 10-3 *"The following measures can be applied to detect overflows;…visual inspection…a chalk mark…wood blocks...mechanical counting device…"*

Request: SWSC has developed a model to predict CSO overflow events with respect to rainfall. In accordance with the above EPA guidance, SWSC requests that CSO events (see definition of event below) be recorded on DMR submittals in accordance with the model predictions. In the event that model predictions are no longer acceptable to EPA, SWSC requests the option to use a variety of CSO activation recordings such as the EPA-approved methods of wood blocks, chalk lines, and mechanical counting devices, as well as any flow meters that may be available.

b) In addition to the above comments, this section of the draft permit also requires that *"cumulative precipitation per discharge event shall be calculated."*

SWSC requests that EPA define the term "event." SWSC suggests that language previously approved by EPA be used:

In a hydraulically connected system that contains more than one CSO outfall, multiple periods of overflow from one or more outfalls are considered one overflow event if the time between periods of overflow is no more than 24 hours without a discharge from any outfall.

Request: Define "event" using the above-noted EPA definition.

c) SWSC presently has four rain gauges, which are electronically connected to the SWSC, located within critical areas of the combined sewer system. The nearest National Weather Service (NWS) rain gauge is located more than 20 miles away from the combined sewer service area. It does not represent precipitation conditions in the combined sewer service area, especially during summer thunderstorm events, where the NWS station could record no rain while a localized high intensity thunderstorm event in the combined sewer service area could cause CSOs activation at multiple locations. SWSC requests that SWSC's rain gauges be approved for the use of calculated cumulative precipitation.

Request: Allow the use of SWSC current rain gauges to calculate cumulative precipitation.

10. Prohibition of DWO: In section I.B.3.d, the permit states: "Dry weather overflows (DWOs) are prohibited (NMC #5)…"

While this section does not define "dry weather," the draft permit Part I.A.1.(e) defines dry weather: *"Dry weather is defined as any calendar day on which there is less than 0.1 inch of rain and snow melt."*

It is not uncommon for a CSO to discharge with 0.1 inches of rain, depending on the intensity of the storm, and the location of the rain measurement gauge in relationship to the CSO discharge. SWSC objects to this definition of dry weather, particularly since the measurement of snow melt is not clearly defined or determined. It may be that during a sunny, warm winter day, a significant amount of snow melt could trigger a CSO discharge.

SWSC cannot at this time determine that a CSO event would not be triggered by 0.1 inches of rainfall, relative to intensity and duration and in combination with a snow melt event.

Request: SWSC requests that EPA remove the definition of "dry weather" located in Part I.A.1.(e) of the draft permit, to avoid any confusion as it relates to DWOs.

11. Address Pump Stations in the Permit: In the current CSO NPDES permit (MA 010331), SWSC notes that five pumping stations are identified in Attachment B as follows:

Discharge No.	Location
030	Liberty Street Pumping Station
031	Canton Circle Pumping Station
032	Carew Street Pumping Station
040	Tiffany Street Pumping Station
050	Indian Orchard Pumping Station

Attachment B states: *"Discharges of wastewater from any other point source, including the pumping stations listed above (Attachment B) are not authorized by this permit and must be reported in accordance with Part II.B.4 (General Requirements – Bypasses) of this permit."*

SWSC notes that the draft permit has eliminated the listing of these five pumping station locations. While SWSC recognizes the inclusion of named bypass locations does not authorize the bypass, and does not provide any additional regulatory relief in the event of a bypass, SWSC requests the named locations remain in the permit to provide a more meaningful understanding of the Springfield collection system and of historic locations of bypasses.

Request: SWSC requests the five named pumping stations be retained in the new, combined NPDES permit. SWSC understands that the prohibition of discharge language will continue to be associated with these locations.

12. Prohibition of Septage:

a) Prohibition of Acceptance during Secondary Bypass: In the draft permit page 5 of 24, footnote 3 states: *"The Permittee shall not accept septage during any calendar day in which a bypass of secondary treatment is anticipated."*

This is a concern for the following reasons:

SWSC is not aware of any legal, regulatory or plant performance basis to include this requirement in the draft permit. Please provide such a basis so that SWSC can critically examine the need for this requirement.

This represents an absolute prohibition of an activity, based upon the "best guess" of treatment plant operation regarding a future weather event. Meteorologists, who study the weather and are paid to predict the weather, are often incorrect; therefore, the expectation that a treatment plant operator can predict future weather events to the extent that he/she can predict the intensity and duration of a rain event's impact to require secondary bypassing is unreasonable.

The SWSC has reviewed plant performance on wet-weather days when septage is received, and determined that the acceptance of septage does not impact the ability of the SRWTF to meet effluent limitations and maintain compliance with water quality standards. Further, all septage is received at a designated septage receiving facility, where screening and grit removal are performed prior to conveyance to the treatment facility.

The prohibition of septage receiving will create very real environmental challenges in that disruptions to septage receiving schedules and the need to turn away septage haulers has the potential to create an environmental hazard as homeowners and businesses will be unable to have their tanks pumped at critical times, the hauler may not have the ability to store the septage until the plant is able to accept it, and this creates an environment of unpredictability for waste haulers.

Request: Since no regulatory basis has been provided for this requirement; SWSC's plant performance is not impacted by septage during wet-weather events; all septage receives screening and grit removal; and all secondary bypass flows receive screening, grit removal, primary treatment and disinfection, SWSC requests that the language pertaining to the prohibition of acceptance of septage during secondary bypass in footnote 3 be deleted.

b) Prohibition of Septage to the Combined Collection System: Part 3.c, page 11 of 34, states: *"Discharges to the combined system of septage, holding tank wastes, or other material which may cause a visible oil sheen or containing floatable material are prohibited during wet weather when CSO discharges may be active."*

Since wastewater (separate as well as combined) typically contains floatable material, SWSC objects to the inclusion of "or containing floatable material" in this section. Such a permit requirement is unreasonable as there is no way to practically manage such discharges into the combined systems through sanitary sewer connections.

Request: Since no regulatory basis has been provided for this requirement; SWSC's plant performance is not impacted by septage during wet-weather events; all septage receives screening and grit removal; and all secondary bypass flows receive screening, grit removal, primary treatment and disinfection, SWSC requests that the language pertaining to the prohibition of septage to the combined collection system be deleted.

13. Operation and Maintenance: SWSC notes that both SWSC and the six co-permittees are required to comply with draft permit Part D "Operation and Maintenance of the Sewer System." Items of concern are as follows:

a) To the extent feasible, the permit should identify which of the seven permittees (SWSC and six towns) own which treatment works. Owners of named collection systems, pumping stations, outfalls, regulators, catch basins, etc., should be identified in the final permit. This will not only help to identify responsible entities, it will also provide valuable guidance for future compliance actions that EPA may choose to take, so that the appropriate responsible party may be known.

b) Maintenance Staff: The draft permit requires that "adequate staff" shall be provided. Adequate staff is not defined in the permit, nor can a meaningful definition be determined. As per MassDEP requirements at 314 CMR 12.04(4), SWSC currently completes a biennial staffing report, which details staffing levels. The submission of the biennial staffing report should be sufficient.

c) Preventative Maintenance Program: *"The permittee and co-permittees shall each will (sic) maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure."* Even the best maintained systems may experience unexpected failure. It is suggested that the language be modified as follows:

"The permittee and co-permittees shall each maintain an ongoing preventative maintenance program with the goal to prevent overflows and bypasses….

d) Infiltration/Inflow: Part D.5.b.(6) *"The permittee and co-permittee shall each… (require) A description of the permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts."* This requirement is not enforceable or practical for the following reasons:

1) In the event of a flow-related violation of the treatment plant's effluent limitations, in what manner would EPA determine the extent and liability of each (or all) of the six named co-permittees? How would EPA determine which town's I/I program was insufficient and the cause of a wet-weather plant effluent violation? How would EPA determine the violation was actually due to I/I? It is obvious that a correlation of controlling I/I from seven municipalities (six co-permittees and the City of Springfield) is not feasible, practical or enforceable.

2) The service agreement between SWSC and the six co-permittees provides that flows from the customer towns be "capped" at identified levels. Further, EPA guidance provides that a town may determine whether it is economically more feasible to remove the I/I or treat the I/I.

EPA has historically defined excessive infiltration/inflow as the *"quantities of I&I which can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis-that compares the costs for correcting the I&I conditions to the total costs for transportation and treatment of the infiltration/inflow."*

Note that EPA Region I uses this definition in its June 2014 publication entitled: "Guide for Estimating Infiltration and Inflow." https://www3.epa.gov/region1/sso/pdfs/Guide4EstimatingInfiltrationInflow.pdf.

3) MassDEP already has a robust program for I/I analysis at 314 CMR 12.00, which requires all sewer authorities to submit an I/I analysis or I/I plan on or before December 31, 2017, consistent with MassDEP's Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Surveys (Guidelines). More specific requirements are located at 314 CMR 12.04, which provides for a comprehensive and detailed I/I program, including detailed requirements for combined sewer systems and all systems contributory to combined systems.

Request: SWSC requests the permit requirements reflect that conformance with MassDEP 314 CMR 12 will satisfy the I/I portions of this permit.

e) Collection System Mapping: Within 30 months of the effective date of this permit, the permittee and co-permittees shall each prepare detailed and extensive collection system mapping. Please provide the regulatory authority for this request, as well as the level of detail of this request. If the requirement is retained, SWSC requests the following modifications:

- Mapping is required of all sanitary sewers and manholes. Please revise this language to state, "All sanitary sewer extensions in the public-right-of way."

- Where the requirements mention information such as pipe diameter, date of installation, type of material, distance between manholes, interconnections, etc., please revise this language to include "to the extent feasible."

- Please allow 36 months to comply with this requirement to allow sufficient time to do procurement and provide a meaningful work product.

14. Monitoring and Reporting: The draft permit, Part I.I., Item 2 (page 21 of 24), states: *"Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR."*

This language fails to address what timeframe reports may be submitted on Net DMR, merely that such a submission would be timely.

Request: SWSC requests that the language be revised to reflect that a report is considered timely if it is submitted electronically on the month following the initial report due date.

15. **Collection System Operation and Maintenance Plan:** Regarding draft permit page 15 of 24, Part D.5.a and page 16 of 24, Part D.5.b, both containing reporting and other requirements relative to the operation and maintenance plan for the collections system, SWSC has the following comments:

    Part (a) requires the submission of a report that provides a description of the collection system management goal, staffing information management, and legal authorities. In addition, it requires a list of pump stations, recent studies and construction activities, and a plan for the development of a comprehensive operation and maintenance plan.

    Six months is an insufficient amount of time to research, analyze, describe and report on these numerous items, particularly for any co-permittees who may not have done this in the past. In addition, the permittee and co-permittee each have its own procurement process that require board, City/Town council or meeting, and/or public work committee for approval of funding, preparation of request for proposal to select consulting firm, negotiation of contract with selected firm to start the work. This process typically take 9-12 months. Therefore, SWSC requests that 18 months be allowed for compliance with this condition.

    Part (b) requires that a complete and comprehensive Operation and Maintenance (O&M) Plan be completed, implemented, and submitted to EPA and MassDEP within 24 months. As above, this is a tremendous undertaking requiring an extensive amount of time and resource, particularly for any co-permittees who do not already have the prescribed O&M plan. In addition, the permittee and co-permittee each have its own procurement process that require board, City/Town council or meeting, and/or public work committee for approval of funding, preparation of request for proposal to select consulting firm, negotiation of contract with selected firm to start the work. This process typically take 9-12 months. Therefore, SWSC requests that 36 months be provided for the completion and implementation of this plan.

    Request: SWSC requests that 18 months be provided for the completion of section (a) and 36 months be provided for the completion of the O&M plan under section (b).

Comments Related to Plant Effluent and Monitoring Issues

16. **Pre-treatment:** The draft permit page 19 of 24, section I.G (Industrial Users and Pretreatment Program), states: *"Within 120 days of the effective date of this permit, the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits."* Since SWSC's procurement process includes board approval for funding, preparation of request for proposal to select consulting firm, negotiation of contract with selected firm to start the work. This process typically take 9-12 months. SWSC believes120 days is an entirely insufficient time for SWSC to prepare a technical report to EPA regarding the need to revise local limits.

In addition, this section also requires that, *"Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval."* This is similarly an insufficient amount of time to complete such an analysis.

Request: SWSC requests that 18 months be provided for SWSC to prepare a technical evaluation analyzing the need to revise local limits, and that an additional 18 months be provided to revise local limits, if needed.

17. **E. Coli Monitoring Requirement:** The draft permit page 3 of 24, Part I requires compliance with E. Coli limits for the first time. While SWSC has no objection to the change in pathogen criteria from fecal coliforms to E. Coli, SWSC requests a period of time to review plant performance relative to E. Coli, adjust disinfection levels if needed, and better understand plant performance under all weather conditions, prior to this new limit becoming effective.

    Request: SWSC requests that a compliance schedule of 18 months be provided prior to the new E. Coli limits becoming effective.

18. **Total Residual Chlorine Monitoring:** The draft permit, page 6 of 24, footnote 8 requires the minimum level (ML) for total residual chlorine (TRC) as 20 ug/L (0.02 mg/L). Further, the draft permit states: *"This value is the minimum level for chlorine using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater. Method 4500 CL-E and G. One of these methods must be used to determine total residual chlorine."*

    a) With respect to Method 4500 CL-E (Low-Level Amperometric Titration):

        1) In theory, Low-Level Amperometric Titration can be used to measure chlorine concentration at the required 0.02 mg/L level. However, a ML for TRC cannot be established in the low level (0.02 mg/l) range because one cannot obtain a certified, ready-made standard at that low level. According to Standard Methods, the minimum reporting level must be set to a concentration at or above the lowest standard used in the analysis.

        2) Nevertheless, SWSC is aware of laboratories that have attempted to confirm the reproducibility of this method in the 0.02 mg/l range. Significant issues were identified in obtaining reproducible results, and in fact, so much difficulty was observed in New Jersey that New Jersey Department of Environmental Protection is not requiring this method.

    b) With respect to Method 4500 CL-G (Colorimetric):

        1) According to Standard Methods, the proposed method has *"…a minimum detectable concentration of approximately 0.01 mg/L under ideal conditions. Normal working detection limits typically are higher."* The estimated detection limit, as stated by the manufacturer (Hach) of the colorimeter, is 0.02 mg/L. According to the August 19, 2014 EPA federal register (490009), that gave guidance on using sufficiently sensitive test methods (SSTM), the "minimum level" refers to either the sample

concentration equivalent to the lowest calibration point in a method or a multiple of the detection limit. Typically, MLs are three to five times the detection limit. Clearly, the reporting limit should not be equal to the minimum detection limit.

2) Attempting to verify the accuracy of a standard made at 0.02 mg/L within the required ± 10% of the actual value is impossible. Because the meter only reports values in ±0.01 mg/L increments, any value between 0.015 mg/L and 0.024 mg/L (or ± 25% of the actual value) would result in a reported value of 0.02 mg/L. To properly verify the accuracy, one must use a standard of 0.10 mg/L (which would result in an acceptable range of 0.09 to 0.11 mg/L).

3) The lowest certified ready-made standard that can be purchased is 0.10 mg/L. All other standards are made by diluting a certified standard in the 25-30 mg/L range. Creating a standard through dilution introduces further uncertainties into the verification process. SWSC is aware of a laboratory that performed several validation tests by diluting a standard to 0.060 mg/L (or three times the estimated detection limit). The readings from the handheld colorimeter were not within 10% of the standard. Further refinement of the DPD Colorimetric Method may be needed to achieve reliable results in the 0.06 mg/L range.

4) In accordance with the Federal Sufficiently Sensitive Test Method Rule, CWA at 40 CFR Parts 122 and 136, *"An applicant can demonstrate that, despite a good faith effort to use a method that would otherwise meet the definition of 'sufficiently sensitive' the analytical results are not consistent with the QA/QC specifications for that method, then the Director may determine that the method is not performing adequately and the applicant should select a different method from the remaining EPA approved methods."*

5) Given the proposed TRC effluent limits of 0.26 and 0.46 mg/l, there is no reason to require a ML as low as 0.02 mg/l.

Request: SWSC requests that the ML for TRC be modified to 0.1 mg/l. This provides a sufficiently sensitive ML in order to determine compliance with the lowest limit of 0.26 mg/l, yet is high enough to avoid concern over the ability of either method to accurately read results at lower concentrations.

19. TSS and BOD Percent Removal: In the draft permit, Part I.A.1.(e) (page 8 of 24) states: *"The permittee's treatment facility will maintain a minimum of 85 percent removal of both the total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rain and snow melt. The percent removal shall be calculated as a monthly average using the influent and effluent BOD5 and TSS values collected during dry weather days."*

The following concerns are noted:

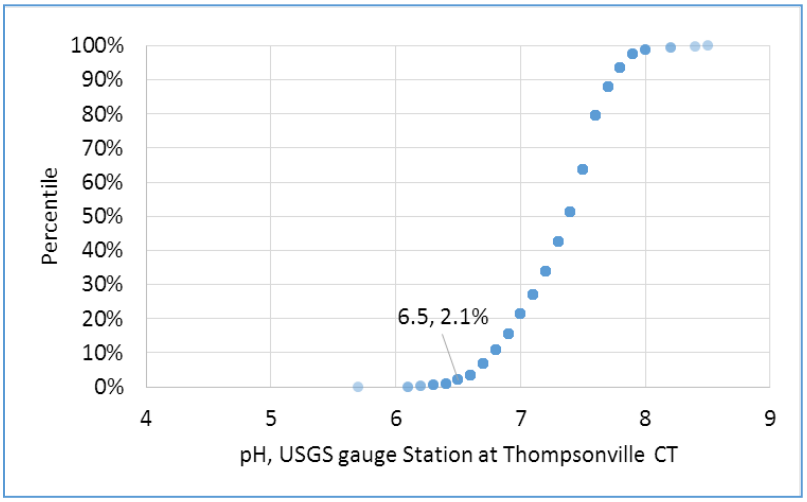
a) Definition of Dry Weather: The permit does not identify where the rainfall is to be measured within the sewershed, nor how snow melt is to be calculated to

determine a rainfall equivalent to 0.1 inch per day. In fact, SWSC is not aware of any method that can reliably correlate snow melt on any given day in various locations (which is subject to a number of factors) to rainfall.

Further, and of even greater concern, is that EPA has included a rainfall amount at all. While the measurement of 0.1 inches of rain in any calendar day is one indicator of wet-weather flows at a treatment facility, SWSC finds that more often it is the intensity of the rain event itself, rather than the total quantity, which impacts treatment facility operations.

EPA has routinely utilized the following language in New York NPDES permits:

"…(rainfall) which causes plant flows over the permitted flow for a calendar day, the CBOD and TSS influent and effluent results for that day shall not be used to calculate the 30-day arithmetic mean value concentration limitations."



Request: SWSC requests that EPA remove the definition of "dry weather" in this provision, and specify that the days excluded from the percent removal calculation, as wet-weather days are those days on which plant instantaneous (peak hourly) influent flows exceed 67 MGD.

20. pH Effluent Limit Range: Part 1, page 3 of 24, contains a pH limit of 6.5 – 8.3 s.u.. Secondary treatment standards established at 40 CFR Part 133.102(c) allow for pH limitations to be assigned as 6.0 s.u. – 9.0 s.u. This is the range specified in NPDES permit for the nearby Holyoke wastewater treatment plant, which also discharges to the Connecticut River. 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). SWSC has examined ambient water quality data for pH (chart below) in the vicinity of the outfall (Connecticut River at Thompsonville, CT (USGS 01184000) and determined that the background pH ranges from 6.0 to 8.4 s.u. This high quality dataset contains 853 pH measurements over a long period of time; the range of 6.0 to 8.4 s.u. captures the 1% to 99% percentiles, providing a reliable background range.

Request: SWSC requests that allowable pH range be changed from 6.5 – 8.3 to 6.0 – 8.4 s.u, consistent with the secondary treatment standards of 6.0 – 9.0 s.u., in order to refect measured background conditions in the receiving water.

21. <u>Influent 24-Hour Composite Sampling:</u> The draft permit, on page 3 of 24, requires 24-hour composite sampling for both BOD5 and TSS. Footnote 6 further describes the sampling as: *"A 24-hour composite sample will consist of at least twenty-four (24) grab samples taken during one consecutive 24 hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow."*

Currently, SWSC uses four (4) samplers at the influent structure, one each for the Agawam forcemain pipe, West Springfield forcemain pipe, York Street forcemain Pipe, and the Main Interceptor Pipe. Due to the nature of the current system, there is not adequate mixing in the influent structure to obtain a representative sample without using four individual samplers.

Each sampler takes a fixed sample amount every 15 minutes into a 5-gallon jug. From each 5-gallon jug, a set amount of combined sample is further combined to form a representative influent sample. The amounts are: Agawam forcemain: 220 mL; West Springfield forcemain: 220 mL; York Street forcemain: 490 mL; and the Main Interceptor: 1,070 mL.

In order to provide "at least twenty-four (24) grab samples…either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow" would be excessively burdensome, and likely infeasible due to the current influent structure design. In order to provide samples that are both continuously timed and flow proportional, SWSC would need to purchase an additional 4 samplers (8 total) and have four samplers timed and four samples with a flow proportional signal, and then compare the results between the two. Even if SWSC could configure such an arrangement, the sampling process is overly burdensome and not necessary to provide a representative sample.

SWSC believes that a timed flow sample is a representative sample, and a flow proportional sample at this time is both unnecessary and infeasible.

<u>Request</u>: SWSC requests that EPA allow the current method of a timed flow sample to be considered a representative sample.

22. <u>Total Nitrogen Monitoring Frequency</u>: In Part 1.A.1, page 4 of 24, EPA should clarify that total nitrogen (TN) reporting is a calculation, not an additional analyte for SWSC to analyze. TN is simply the sum of Nitrate + Nitrite plus total Kjeldahl nitrogen, both of which are already required to be analyzed weekly in the draft permit.

Average monthly load should be specified to be equal to the average monthly concentration multiplied by the average monthly flow. Maximum daily load should be specified to be equal to the maximum load on the days that concentrations were analyzed (i.e., concentration on that day multiplied by daily flow on that day). In addition, while SWSC's current and draft permit require that flow be reported on the DMR as a 12-month rolling annual average, the appropriate flow to be used when calculating a monthly load is the specific month flow of the time period being monitored. This needs to be noted in the permit.

<u>Request:</u> SWSC requests that footnotes be added to clarify that TN is a calculation, as described above, and to clarify the definitions of average monthly load and maximum daily

load. Specifically, clarify whether monthly load calculations shall be based upon the average monthly flow for the month in question or upon the 12-month rolling annual average.

23. <u>Sampling Program</u>: In the draft permit page 5 of 24, footnote 4 states:

"A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report. Any changes to the routine sampling program must be reviewed and approved in writing by EPA and MassDEP."

While SWSC has no particular objection to providing EPA and MassDEP with a sampling schedule, nor with the requirement to append the DMR with correspondence at any time the routine protocol is not followed, the need for EPA and MassDEP to approve such a deviation is problematic.

First, SWSC is not aware of any regulation, law or regulatory guidance that governs the standards against which EPA and MassDEP would review the deviation from sampling protocol. Second, SWSC must be allowed the flexibility to modify sampling times based upon best professional judgement at the time of sampling, without the need of the regulator's pre-approval.

Finally, while SWSC has no objection to providing an explanation as to the circumstances surounding a deviation from sampling as an attachment to the DMR, the requirement that EPA and MassDEP approve the deviation is problematic. The plant operator would only deviate from the sampling plan in the event of critical and significant need, that he/she will determine based on best professional judgement at the time of the sample. It is not acceptable for EPA or MassDEP to potentially determine a sample invalid weeks or months after the fact. In the event EPA or MassDEP believes the deviation from the routine sampling was not substantiated, SWSC should be notified of the reason, in writing, and advised to avoid the situation in future sampling events.

<u>Request:</u> SWSC requests that the language be revised as follows:

"A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report. ~~Any changes to the routine sampling program must be reviewed and approved in writing by EPA and MassDEP~~."

<u>Comments Related to Total Nitrogen TMDL Implementation Issues</u>

24. <u>Total Nitrogen Optimization Benchmark</u>: In Part I.H.1.a, page 20 of 24, the permit states: *"The Permittee shall continue to optimize the treatment facility operations relative to total nitrogen ('TN') removal through continued ammonia removal, maximization of solids retention time while maintaining compliance with BOD and TSS limits, and/or other operational changes designed 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." On pages 19-21 of the Fact Sheet, it is stated: *"Invitation for Public Comment on Three Options for Addressing Nitrogen Discharges from the Springfield Regional Wastewater Treatment Facility."*

The permit provides three potential options, as described in the Fact Sheet, for maintaining compliance with the nitrogen targets established by the December 2000 Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound (LIS TMDL). Of those three options, the Clean Water Act (CWA) only authorizes EPA to require Alternative 2. EPA's proposed application of an existing loading estimate as a new benchmark target is completely without technical or regulatory justification.

Request: SWSC requests that EPA incorporate Alternative 2 into the final NPDES permit at Part I.H.1.a as follows. "The Permittee shall continue to operate the treatment facility such that compliance with ammonia, BOD and TSS limits is maintained, while at the same time optimize nitrogen removal process to achieve an annual average benchmark concentration of 8 mg/L total nitrogen." [Alternative 2] The technical and regulatory bases for this request is provided below.

Basis for Comment

The SRWTF discharges into the Connecticut River. SRWTF's existing permit requires monitoring for nitrogen with report only "limits" for ammonia, nitrite and nitrate, and total Kjeldahl nitrogen. EPA records that from 2012 to 2016, SRWTF's annual TN load averaged 2,279 lbs/day, ranging from 1,650 lbs/day to 2,543 lbs/day. As part of the LIS TMDL, EPA established a baseline nitrogen loading for "out-of-basin" point sources discharging into the Connecticut River. The LIS TMDL defines "out-of-basin" to mean outside of states that border the Long Island Sound; with regard to the Connecticut River, "out-of-basin" means the State of Massachusetts, Vermont and New Hampshire. The LIS TMDL establishes a wasteload allocation (WLA) for out-of-basin point sources discharging into the Connecticut River basin that represents a 25% reduction from the 1990 baseline nitrogen loading.

Summary of LIS TMDL as it Applies to Draft SWSC Permit

Nitrogen is not the cause of any impairment identified in the Connecticut River. As EPA states in the permit Fact Sheet, pages 18-19, the basis for the proposed regulation of TN is the LIS TMDL; the nitrogen-driven eutrophication impacts in the Long Island Sound are driving the proposed reductions in nitrogen at SRWTF. As EPA describes, the Connecticut Department of Energy and Environmental Protection and New York Department of Environmental Protection developed the LIS TMDL to address the problems associated with excessive nitrogen loadings in the LIS. In accordance with the CWA, the LIS TMDL establishes TN WLAs for in- and out-of-basin sources. Those out-of-basin point sources include wastewater treatment facilities discharging into the Connecticut, Housatonic, and Thames Rivers. For out-of-basin wastewater sources, the LIS TMDL requires a 25% reduction in the TN loading baseline established during the promulgation of the LIS TMDL.

The LIS TMDL baseline for out-of-basin TN wastewater loadings in the Connecticut River was 21,672 lbs/day. The allocation of TN load to out-of-basin wastewater sources (based on a 25% reduction from the baseline) equals 16,254 lbs/day. That target remains unchanged, as the LIS TMDL is still effective and has not been modified

or redeveloped. As early as 2004 to 2005, the Connecticut River achieved more than a 25% aggregate reduction in TN wastewater loadings. Indeed, the estimated 2004 to 2005 TN wastewater loading to the Connecticut River was 12,836 lbs/day (15% less than the allowable TMDL load).

Section 303(d) of the CWA requires states to develop a TMDL management plan for waterbodies containing water quality limited segments [33 U.S.C. § 1313(d), (e)]. The TMDL first estimates the assimilative capacity of the waterbody relative to a particular pollutant. The TMDL then allocates that assimilative capacity among point (WLAs) and non-point pollutant sources (load allocations), taking into account natural background levels and a margin of safety (40. C.F.R. § 130.7). Permitting authorities then develop permit limits for point sources that are consistent with the WLAs for each point source (Id).

The permittee understands EPA's objective in achieving greater nitrogen reductions in order to address the eutrophication issues afflicting the LIS; however, the permit limitations for out-of-basin point sources, like SRWTF, must be based on the WLA for the Connecticut River established by the LIS TMDL. Beyond the fact that the SRWTF achieved an annual average of 2,279 lbs/day for TN during certain years, EPA identifies no statutory or regulatory justification for applying that loading benchmark. In other words, EPA has identified no rational relation between the 2,279 lbs/day loading benchmark derived from the 2012 to 2016 monitoring data and the WLA for the Connecticut River, which out-of-basin point sources achieved over a decade ago. Accordingly, the CWA does not authorize the imposition of the proposed 2,279 lbs/day loading benchmark in the permit.

Analysis of Proposed Permit Requirements Relating to Nitrogen

The permit currently contains a loading benchmark of 2,279 lbs/day. EPA ostensibly bases this loading benchmark on the TMDL target for the Connecticut River (Fact Sheet, pages 19–20). However, EPA itself estimates that the 2,279 lbs/day loading benchmark for SRWTF will result, when combined with the other out-of-basin wastewater loads, in an estimated wastewater loading to the Connecticut River of 14,467 lbs/day. This estimated loading represents a 33% reduction from the baseline of out-of-basin wastewater TN loadings to the Connecticut River (Fact Sheet, page 20, Table 5). The LIS TMDL, however, only requires a 25% reduction from the 21,672 lbs/day baseline established for out-of-basin wastewater loadings of TN to the Connecticut River. Plainly, the CWA does not authorize EPA to require that SRWTF achieve a 33% reduction from the baseline established by the 2000 LIS TMDL. Rather, the LIS TMDL established, through proper procedure, a 16,254 lbs/day target, for which SRWTF's "report only" requirement has been more than sufficient.

As described below, SWSC is already in compliance with nitrogen TMDL requirements, and there is no potential for it to exceed the TMDL requirements given its current level of treatment. There is therefore no justification for EPA to impose new requirements for TN, nor is there a technical or regulatory basis to require that SWSC maintain its existing mass loading level.

The TMDL target for out-of-basin wasteloads for the Connecticut River is 16,254 lbs/day of TN, which is 25% lower than the TMDL baseline load of 21,672 lbs TN. Note that the TMDL baseline was based on loading conditions in 1990, when SRWTF was a conventional activated sludge plant (extended aeration process) with no biological

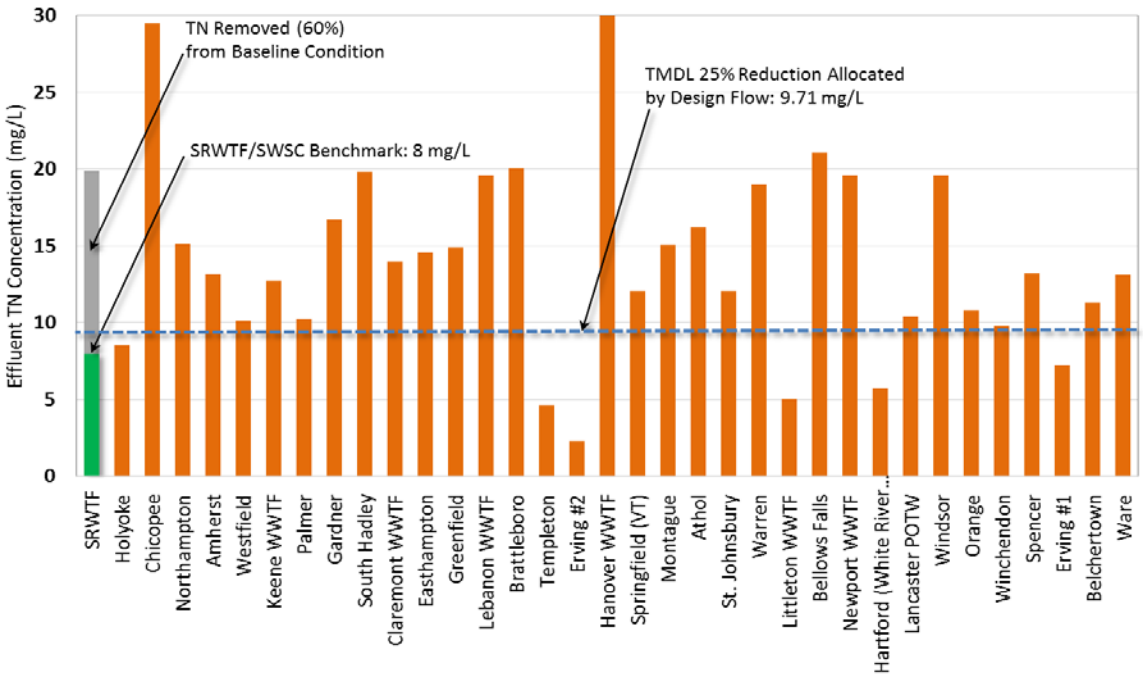
nutrient removal capability and discharged an effluent with total nitrogen around 19.6 mg/L[14]. Attachment B includes a summary of SRWTF's original design, upgrade and operation history. In anticipation of the TMDL, SWSC upgraded SRWTF in 1995 to incorporate nitrogen removal. As a result and shown in Attachment C, Statistical Analysis of SRWTF Effluent TN Concentrations, SRWTF consistently discharges TN concentrations less than 10 mg/L, which represents a decrease of approximately 50% compared to TMDL baseline conditions.

The revised loading estimate based on 2004-2005 DMRs indicated that the TMDL target for out-of-basin TN wasteloads from the Connecticut River had already been satisfied, with actual loads 15% below the allowable load. However, this does not mean that out-of-basin facilities will not be required to remove additional nitrogen. Indeed, if all the out-of-basin treatment plants were discharging their maximum permitted (design) flows at their existing TN effluent concentrations, the TMDL target would be exceeded by more than 30%. In order to maintain compliance with the TMDL, wastewater facilities in the Connecticut River basin that have not upgraded to remove nitrogen will need to do so as their actual flows increase closer to their maximum design flows.

Having noted this, the EPA's proposed use of existing loading estimate as some kind of new target is completely without technical or regulatory justification. Such a flawed approach would punish those facilities, like SRWTF, that have already upgraded and exceed required load reductions; it would not be justified to expect the same percent reduction from an upgraded plant as from a plant that had not upgraded. It is arbitrary and capricious to force a "benchmark" similar to an effluent limitation, or somehow interpret or extrapolate requirements set forth for SRWTF, in a manner creating significant, binding, regulatory consequences that would unfairly burden SWSC's ratepayers.

Instead, the TMDL combined wasteload allocation for the out-of-basin dischargers in the Connecticut River basin must be allocated among individual dischargers. While EPA certainly has some latitude in allocating the allowable TMDL wasteload among individual dischargers, the fairest and most straightforward way to do this is based on design flows. The TMDL-based calculated load for SRWTF would be 5,429 lbs/day, which is SRWTF's share of the allowable wasteload of 16,254 lbs/day based on its share of the total design flow (67 MGD out of 201 MGD). Based on its design flow of 67 MGD, the effluent concentration associated with SRWTF's individual wasteload would be 9.71 mg/L TN. To optimize biological nutrient removal at SRWTF, an optimization benchmark of 8 mg/L TN would ensure compliance with the annual average TMDL threshold concentration of 9.71 mg/L or the associated TMDL load of 5,429 lbs/day. There is no technical or regulatory basis to require SWSC to perform additional TN removal optimization, since it is already discharging considerably less TN than is allowable by the TMDL. The figure below shows the effluent TN concentrations of major out-of-basin dischargers to the Connecticut River basin, in order based on design flow, in comparison to the allowable annual average TN concentration of 9.71 mg/L at design flow capacity. SRWTF is one of only a few dischargers with effluent TN concentration that will satisfy the allowable TMDL load at its design capacity.

[14] EPA's estimate of non-BNR plant based on an average of discharge concentration from conventional activate sludge plant in Massachusetts.



Average Annual Effluent TN Concentration from Out-of-Basin POTWs Tributary to the Connecticut River with Design Flow Greater than 1.0 MGD.

Evaluation of Proposed Optimization Requirements

EPA requires that SRWTF *"continue to optimize operations to meet a benchmark based on the current annual average TN load of 2,279 lbs/day"* based on the annual average TN load from 2012 to 2016 (Fact Sheet, pages 19–20). Further, certain provisions of the CWA authorize EPA to require certain control measures and proper operation and maintenance, but the statutory scheme does not authorize EPA to prescribe how a plant operator must achieve those requirements. Here, "optimization" is not an applicable control measure or operation and maintenance requirement deriving from any statutory or regulatory CWA authority.

Even if the CWA authorized the imposition of an optimization requirement, the requirement as described in the permit is impermissibly vague. EPA has not promulgated under the CWA any rule, guidance, or definition regarding what constitutes "optimization." Absent a clear statutory or regulatory directive regarding optimization, permittees have no opportunity to meaningfully comply with the requirement. For example, permittees have no guidance regarding whether or not optimization to "enhance nitrogen removal" could require additional expenditures for operation and maintenance or capital improvements. Additionally, even if SRWTF meets the permit's benchmark TN requirements, the optimization requirement still exposes the permittee to liability in the form of potential permit violations or lawsuits from third-parties alleging that the permittee nonetheless failed to achieve some amorphous level of "optimization" or "enhanced nitrogen removal."

Ultimately, EPA has not identified, and the permittee is not aware of, any statutory or justification authority for the "optimization" requirement. The requirement both is impermissibly vague and exceeds EPA's authority where the out-of-basin point

sources, including SRWTF, are already achieving the WLA for the Connecticut River.

Evaluation of Proposed Benchmark Alternatives

It is a widely acceptable practice in the wastewater treatment field that performance of process technologies is typically evaluated by effluent concentration (as opposed to effluent load) of the targeted compounds, e.g. BOD, TSS, NH3-N. Effluent TN concentration must therefore be the basis of any benchmark for performance evaluation/optimization.

Attachment D provides a literature review of design guidance, fact sheets, operation manuals and peer reviewed papers/reports. These well-established references and practices suggest that 8 mg/L TN is an appropriate effluent benchmark for the "typical" performance of BNR systems employing the Ludzack-Ettinger (LE) process configuration similar to the BNR process employed at SRWTF. Attachment D concludes the following:

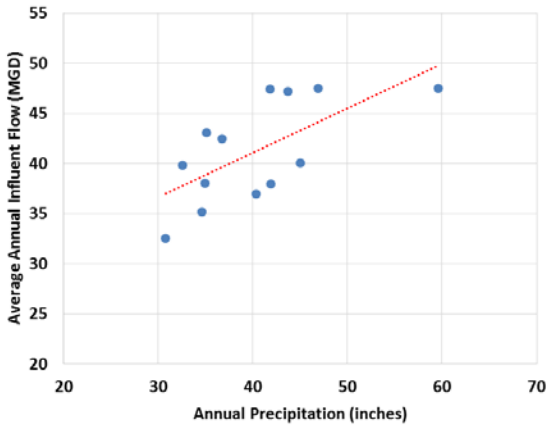
> Utilizing effluent concentration (in lieu of effluent loading) as a benchmark for process performance evaluation and optimization is a technically sound approach consistent with industry standards. Based on the performance data available in the literature, it is not reasonable to expect a Ludzack-Ettinger (LE) process (currently SRWTF operates under such biological process mode) to consistently achieve an effluent concentration of lower than 8 mg/L TN because of the physical limitations imposed by its configuration. Therefore, if an optimization target of 8 mg/L TN effluent concentration is established, plants utilizing the LE process will likely require optimization to adjust operation parameters or potentially modifications to operate in different process configuration.

SWSC therefore requests EPA to select factsheet Alternative 2, 8 mg/L for inclusion as permit nitrogen special condition.

SWSC offers the following comments on the three options regarding nitrogen benchmark(s) (Fact Sheet, pages 19-21).

Draft Permit Proposal: Loading Benchmark of 2,279 lbs/day TN; No Concentration Benchmark

According to the Fact Sheet, the proposed loading benchmark was based on the current annual average TN load, which EPA calculated to be 2,279 lbs/day by averaging the TN load discharged from the facility over the last five years (2012-2016). There is no technical or regulatory basis to require that SWSC maintain its existing mass loading level, or its mass loading level during some arbitrary period. The TMDL target for out-of-basin wasteloads for the Connecticut River is 25% lower than the TMDL baseline load in 1990. In anticipation of the TMDL, SWSC upgraded its treatment plant in 1995 to incorporate nitrogen removal. As a result, SWSC consistently discharges TN concentrations less than 10 mg/L, which represents a decrease of approximately 50% compared to TMDL baseline conditions (1990). Prior to 1995, SRWTF was a conventional activated sludge plant with very limited biological nitrogen removal capacity. SRWTF currently discharges approximately 37 to 50 MGD (average annual flow rate since 2004, as shown in Attachment E); flow is highly dependent on precipitation conditions, as shown in the figure to the right. However, it *is authorized to discharge up to its* design flow of 67 MGD. As its discharge flow increases, nitrogen load can be expected to increase proportionately. However, even at its maximum design flow, SRWTF will be discharging considerably less TN load than its share of allowable load. EPA's proposed use of an existing loading estimate as a new benchmark is completely without technical or regulatory justification, and would punish facilities, like SRWTF, that have already upgraded to remove nitrogen.



Correlation between Rainfall and SRWTF Influent Flow (2004 to 2016)

SRWTF's share of the allowable TMDL wasteload for out-of-basin dischargers in the Connecticut River basin will not be exceeded even if SRWTF were discharging at its maximum design flow of 67 MGD, as long as its effluent concentration remains below 9.71 mg/L TN. SRWTF consistently discharges at effluent concentrations below 10 mg/L TN, and would therefore not have any reasonable potential to exceed the TMDL threshold concentration of 9.71 mg/L (which is based on a long-term average) associated with allowable TMDL load. For the same reason, there is no technical or regulatory basis to require SRWTF to perform additional TN removal optimization, since it is already discharging considerably less TN than is allowable by the TMDL. Note also that a TN benchmark expressed as a load conflicts directly with the CSO control objective of maximizing flows to the treatment facility.

Alternative 1: Loading Benchmark of 2,534 lbs/day TN; Concentration Benchmark of 8 mg/L TN

EPA's first proposed alternative includes an annual average concentration-based benchmark of 8 mg/L combined with a higher annual average mass-based benchmark of 2,534 lbs/day (Fact Sheet, pages 20-21). EPA explains that the 2,534 lbs/day loading benchmark equals the maximum annual average TN load discharged from SRWTF from 2012 to 2016 (Id). EPA estimates that even this higher loading benchmark would still achieve an estimated load of 14,772 lbs/day to the Connecticut River from out-of-basin point sources. Again, the 2000 LIS TMDL requires a 25% reduction from the 21,672 lbs/day baseline, but the 2,534 lbs/day benchmark would represent a 32% reduction from that LIS TMDL baseline. Like the proposed 2,279 lbs/day benchmark in the permit, this 2,534 lbs/day benchmark bears no rational relation to the TMDL from which it derives. In other words, if the out-of-basin point sources, including SRWTF, can continue to achieve the actual WLA of 16,254 lbs/day for the Connecticut River, EPA lacks the statutory and regulatory authority to impose more stringent TN loading benchmarks.

As stated above, there is no technical or regulatory basis to require that SRWTF maintain its existing mass loading level. Even if it were discharging at its maximum design flow of 67 MGD, SRWTF would still be discharging less TN load that its share of the allowable TN wasteload.

A benchmark concentration of 8 mg/L TN is reasonable as an annual average optimization benchmark, since meeting the benchmark would ensure that SRWTF will not have any potential to exceed the TMDL threshold concentration of 9.71 mg/L associated with its allowable TMDL load. Note again that a TN benchmark expressed as a load conflicts directly with the CSO control objective of maximizing flows to the treatment facility.

Alternative 2: No Loading Benchmark; Concentration Benchmark of 8 mg/L TN

As stated above, a benchmark concentration of 8 mg/L TN as an annual average is reasonable, since meeting the benchmark would ensure that SRWTF will not have any potential to exceed the TMDL threshold concentration of 9.71 mg/L associated with its allowable TMDL load. Furthermore, expressing the TN benchmark as a concentration rather than a load is fully consistent with the CSO control objectives. Since SRWTF is only permitted to discharge up to 67 MGD as an annual average, any concentration limit or benchmark will effectively impose a loading benchmark as well.

The second alternative would encourage a consistent level of treatment regardless of changes in flow at Springfield. As EPA acknowledges, Alternative 2 will still achieve the LIS TMDL target of a 25% reduction in TN loadings from the LIS TMDL baseline (Fact Sheet, page 21). Indeed, Alternative 2 represents the only option that EPA has statutory authority to impose, as it constitutes the only option that does not impose a nitrogen loading benchmark wholly unrelated to the LIS TMDL nitrogen targets.

Additionally, EPA acknowledges that Springfield anticipates future growth and is currently exploring the possibility of consolidating wastewater flows from other

facilities throughout the Springfield area and diverting them for treatment at the SRWTF. Affording the SRWTF the opportunity to explore this possibility could achieve significantly greater reductions in nitrogen loadings to the Connecticut River than any of the proposed alternatives for this permit. Notably, other facilities in the Springfield area do not have capacity or technology to achieve the advanced required nitrogen removal that the SRWTF is designed for and currently able to achieve. In that regard, any diverted flows will receive a much higher level of nitrogen removal treatment at the SRWTF than they currently receive at surrounding facilities. The impact of reductions in nitrogen loadings from diversion of flow away from less technologically-advanced facilities in the Springfield area to the larger and more technologically-advanced SRWTF would far outweigh the impact of any increased nitrogen loadings resulting from the new diversions to the SRWTF. Expressing the nitrogen benchmark in terms of concentration rather than load will better allow SRWFT to explore these possibilities, which would result in considerable overall load reductions within the watershed.

25. **Total Nitrogen Annual Report Requirement:** Part I.H.1.b, page 20 of 24 states: *"The permittee shall submit an annual report to EPA and the MassDEP by February 1st of each year, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous calendar year. If, in any year, the treatment facility discharges in excess of 2,279 lbs/day TN on an annual average basis, the annual report shall include a detailed explanation of the reasons why TN discharges have increased, including any changes in influent flows/loads and any operational changes. The report shall also include all supporting data."*

There is no basis or justification for additional reporting requirements relating to the discharge of nitrogen loads from the SRWTF. As explained in the comment above, SRWTF has no reasonable potential to exceed its TMDL allocation for nitrogen, even if discharging at its design flow of 67 MGD. Nitrogen discharges from the SRWTF will be reported on monthly through the DMRs; additional reporting for the SRWTF would be duplicative and not justified. Instead, TN reporting should focus on comparison with the benchmark concentration of 8 mg/L on an annual average basis. [Alternative 2]

Request: SWSC requests that the following language be substituted for the draft language at Part I.H.1.b.: "The permittee shall submit an annual report to EPA and the MassDEP by February 1st of each year that documents the average annual nitrogen concentration and load discharged from the facility, and tracks trends relative to the previous calendar year. If, in any year, the treatment facility discharges in excess of 8 mg/L TN on an annual average basis, the annual report shall include a brief explanation of the reasons why TN discharges increased that particular year, including any changes in influent flows/loads and any operational changes. The report shall also include all supporting data."

26. **Future Nitrogen Limits:** On page 21 of the Fact Sheet, EPA includes a section discussing "Future Nitrogen Limits." In this section, EPA indicates that "more work must be done" to address nitrogen, dissolved oxygen, and related water quality issues in Long Island Sound. To address those issues, EPA appears to be pursuing a multi-step process, starting with establishing "thresholds" for certain parts of the Sound watershed, then doing new allocations of TN loadings where necessary, possibly culminating in new water quality-based permit limits. Since those thresholds, allocations and limits have not yet been developed, SWSC has no specific issues to raise in these comments regarding this

section. As a general matter, though, SWSC wants to emphasize that in taking any of the listed possible actions, EPA (and the relevant states in the Sound watershed) will have to follow established procedures that are required under the Clean Water Act and implementing regulations. Specifically, the agencies will need to adopt numeric water quality standards for parameters of concern, assess waters to determine if they meet those standards, include waters on the State 303(d) lists if they do not meet the standards, develop new TMDLs or modify existing TMDLs to address the impairments, and finally, issue water quality-based permit limits that are based on the allocations in the TMDLs. SWSC intends to be an active participant in all of those processes, and it is critical that the agency efforts be transparent and open for any and all stakeholders to play an active and constructive role.

27. <u>Annual Load Estimate 2004-2005:</u> "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." (Factsheet Page 18,Part VII, Nitrogen, second paragraph)

Using 2004 -2005 DMR data to estimate average annual total nitrogen loading from SRWTF is incorrect base on the following reasons:

1. SRWTF DMR reported 10 sets of nitrogen data (as shown in table below) in 2004. Five (5) of the nitrogen data show 0.00 mg/L TKN which include organic nitrogen and NH3, while reported NH3 range from 0.28 to 0.55 mg/L (yellow highlighted in table below). It is wrong to report any TKN with value less than NH3.
2. Statistically speaking, average of 5 data points is inadequate to characterize average annual condition (average of 365 days). It is wrong to use 2004-2005 data for loading estimate and/or plant performance assessment.

Month	NH3	TKN	NO2	NO3	TN	Flow	Pounds
Jan							
Feb	0.32	1.12		2.11	3.23	39.9	1,076
Mar	0.42	1.40		2.19	3.59	41.1	1,231
Apr	0.55	0.00		2.51	2.51	55.4	1,159
May	0.32	0.00		3.11	3.11	48.6	1,259
Jun	0.36	1.18		2.93	4.11	41.5	1,421
Jul							
Aug	0.33	0.00		4.13	4.13	39.5	1,362
Sep	0.45	1.10		4.40	5.50	43.4	1,990
Oct	0.28	0.00		4.00	4.00	39.1	1,306
Nov	0.42	1.96		4.87	6.83	38.5	2,191
Dec	0.40	0.00		3.06	3.06	44.8	1,143
Average	**0.39**	**0.68**		**3.33**	**4.01**	**43.2**	**1,414**

Request: SWSC requests that EPA to eliminate all references to 2004-2005 load of 1,648 lbs/day and acknowledge there was not enough data to characterize average annual condition for that period.

28. **Erroneous Ammonia Data**: The table in Factsheet Attachment H contains erroneous data (yellow highlighted) with Ammonia (not listed in the table) higher than Total Kjeldahl Nitrogen or 0 mg/L TKN. SWSC requests to replace the table with QA/QC'ed table below.

Date	Rolling Annual Average Flow	Ammonia [as N]	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	mg/l	lbs/day	lbs/day
28-02-2001	36.9	0.2	3.1	2.24	5.34	1,638	1643
31-03-2001	48.7	0.9	1.84	2	3.84	1,554	1560
30-04-2001	56.33	0.5	2.26	1.9	4.16	1,948	1954
31-05-2001	44.7	0.5	2.35	1.65	4	1,486	1491
30-06-2001	42.3	0.5	1.74	1.12	2.86	1,006	1009

Date	Rolling Annual Average Flow	Ammonia [as N]	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	mg/l	lbs/day	lbs/day
31-07-2001	41.57	0.7	2.94			0	0
31-08-2001	40.9	0.6	1.86	1.76	3.62	1,231	1235
30-09-2001	37.4	0.0	2.08	1.18	3.26	1,013	1017
31-10-2001	40.25	0.4	1.95	1.18	3.13	1,047	1051
30-11-2001	41.3	0.5	3.18	1.23	4.41	1,514	1519
31-12-2001	40.8	0.7	6.54	3.696	10.236	3,472	3483
31-01-2002	39.1	0.8	3.63	2.3	5.93	1,927	1934
28-02-2002	38.8	0.4	1.47	1.8	3.27	1,055	1058
31-03-2002	37.8	0.7	2.21	1.9	4.11	1,291	1296
30-04-2002	36.4	0.6	3.52	1	4.52	1,368	1372
31-05-2002	36.1	0.4	2.75	1.76	4.51	1,353	1358
30-06-2002	35.7	0.6	3.96	1.18	5.14	1,525	1530
31-07-2002	35.5	0.6	4.14	1.18	5.32	1,570	1575
31-08-2002	35.3	0.5	3.71	1.18	4.89	1,435	1440
30-09-2002	35.2	0.4	0.455	1.6	2.055	601	603
31-10-2002	35.2	0.6	3.93	1.26	5.19	1,519	1524
30-11-2002	35.9	0.3	2.06	1.23	3.29	982	985
31-12-2002	36.3	0.5	3	1.18	4.18	1,261	1265
31-01-2003	37.15	0.0	2.12	1.47	3.59	1,109	1112
28-02-2003	37.38	3.0	3.32	4.12	7.44	2,312	2319
31-03-2003	38.5	1.8	3.14	3.39	6.53	2,090	2097
30-04-2003	39.4	0.7	2.01	1.23	3.24	1,061	1065
31-05-2003	39.8	0.8	4.52	2.24	6.76	2,236	2244
30-06-2003	40.9	1.0	3.65	2.94	6.59	2,240	2248
31-07-2003	41.6	0.6	2.82	2.46	5.28	1,826	1832
31-08-2003	42.2	0.6	3.25	1.18	4.43	1,554	1559
30-09-2003	40.1	0.3	2.17	1.18	3.35	1,117	1120
31-10-2003	44.1	1.0	0.357	2.06	2.417	886	889
30-11-2003	44.8	0.5	2.55	1.23	3.78	1,408	1412
31-12-2003	45.8	0.5	3.2	1.23	4.43	1,687	1692
31-01-2004	46.5	0.0	3.1	2.06	5.16	1,994	2001
29-02-2004	46.6	0.3	2.11	1.12	3.23	1,251	1255
31-03-2004	45.9	0.4	2.19	1.4	3.59	1,370	1374

Date	Rolling Annual Average Flow	Ammonia [as N]	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	mg/l	lbs/day	lbs/day
30-04-2004	46.2	0.6	2.51	0	2.51	964	967
31-05-2004	46.5	0.3	3.11	0	3.11	1,202	1206
30-06-2004	45.6	0.4	2.93	1.18	4.11	1,558	1563
31-07-2004	45.4	0.0	3.23	1.76	4.99	1,883	1889
31-08-2004	45.3	0.3	4.13	0	4.13	1,555	1560
30-09-2004	45.2	0.5	4.4	1.12	5.52	2,074	2081
31-10-2004	44.5	0.3	4	0	4	1,480	1485
30-11-2004	43.7	0.4	4.87	1.96	6.83	2,481	2489
31-12-2004	43.4	0.4	3.06	0	3.06	1,104	1108
31-01-2005	43.2	0.0	3.06	1.47	4.53	1,627	1632
28-02-2005	49.9	0.0	0.988		0.988	410	411
31-03-2005	44.2	0.5	3.58	0	3.58	1,315	1320
30-04-2005	44.2	0.6	2.78	0	2.78	1,021	1025
31-05-2005	44	0.3	2.17	1.18	3.35	1,225	1229
30-06-2005	43.9	0.4	2.03	2.35	4.38	1,598	1604
31-07-2005	43.8	0.7	3.78	1.6	5.38	1,959	1965
31-08-2005	43.6	1.2	4.06	3.23	7.29	2,642	2651
30-09-2005	43.2	0.7	2.12	1.6	3.72	1,336	1340
31-10-2005	45.6	0.2	2.75	0	2.75	1,042	1046
30-11-2005	47	0.9	4.24	1.6	5.84	2,282	2289
31-12-2005	47.5	0.5	4.14	1.4	5.54	2,187	2195
31-01-2006	48.9	0.2	1.78	0	1.78	724	726
28-02-2006	49.9	1.3	0.988		0.988	410	411
31-03-2006	49.7	0.5	1.95	1.76	3.71	1,533	1538
30-04-2006	48.4	1.0	2.79	1.4	4.19	1,686	1691
31-05-2006	48.7	1.6	1.57	2.52	4.09	1,656	1661
30-06-2006	49.8	1.5	1.64	2.94	4.58	1,896	1902
31-07-2006	50.6	1.7	1.18	2.65	3.83	1,611	1616
31-08-2006	51.1	1.5	3.07	2.52	5.59	2,374	2382
30-09-2006	51.3	3.3	2.22	5.54	7.76	3,309	3320
31-10-2006	49.2	0.7	2.82	0	2.82	1,153	1157
30-11-2006	48.4	1.8	0.118	3.08	3.198	1,287	1291
31-12-2006	47.5	0.3	1.81	0	1.81	715	717

Date	Rolling Annual Average Flow	Ammonia [as N]	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	mg/l	lbs/day	lbs/day
31-01-2007	45.7	1.6	0.842	3.53	4.372	1,661	1666
28-02-2007	47.5	3.8	0.606	5.6	6.206	2,450	2459
31-03-2007	43.9	2.5	0.234	4.41	4.644	1,695	1700
30-04-2007	45.2	1.4	1.18	1.18	2.36	887	890
31-05-2007	44.9	1.7	0.131	2.94	3.071	1,146	1,150
30-06-2007	43.7	2.0	2.81	2.24	5.05	1,834	1841
31-07-2007	42.8	0.8	6.75	3.64	10.39	3,696	3709
31-08-2007	42.3	1.2	3.21	2.35	5.56	1,955	1961
30-09-2007	41.9	0.0	3.36	1.47	4.83	1,682	1688
31-10-2007	41.3	0.9	266	0		0	0
30-11-2007	40.4	0.8	2.1	1.54	3.64	1,222	1226
31-12-2007	39.8	0.7	2.37	2.16	4.53	1,499	1504
31-01-2008	39.5	0.8	1.79	1.29	3.08	1,011	1015
29-02-2008	41.5	0.8	2.64	1.18	3.82	1,318	1322
31-03-2008	42.5	0.7	1.86	1.18	3.04	1,074	1078
30-04-2008	41.8	0.6	2.37	1.47	3.84	1,334	1339
31-05-2008	41.7	2.3	3.08	3.23	6.31	2,187	2194
30-06-2008	41.9	0.4	3.92	2.16	6.08	2,118	2125
31-07-2008	42.6	0.5	2.46	1.79	4.25	1,505	1510
31-08-2008	43.7	0.7	2.81	1.67	4.48	1,627	1633
30-09-2008	45	0.4	3.34	2.162	5.502	2,058	2065
31-10-2008	45.6	0.7	3.38	2.35	5.73	2,172	2179
30-11-2008	46.1	1.0	2.96	1.45	4.41	1,690	1696
31-12-2008	47.6	1.0	1.73	1.37	3.1	1,227	1231
31-01-2009	48.1	0.9	3.24	2.07	5.31	2,123	2130
28-02-2009	46.7	2.3	3.19	3.49	6.68	2,593	2602
31-03-2009	45.8	0.8	3.39	1.6	4.99	1,900	1906
30-04-2009	45.1	0.8	3.79	2.31	6.1	2,287	2294
31-05-2009	44.8	0.6	5	2.45	7.45	2,774	2784
30-06-2009	44.8	0.8	4.89	3.2	8.09	3,013	3023
31-07-2009	45.1	0.8	3.28	2.5	5.78	2,167	2174
31-08-2009	44.9	0.3	4.88	1.2	6.08	2,269	2277
30-09-2009	44	0.8	2.87	0	2.87	1,050	1053

Date	Rolling Annual Average Flow	Ammonia [as N]	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	mg/l	lbs/day	lbs/day
31-10-2009	43.7	0.0	2.743	2.8	5.543	2,014	2020
30-11-2009	43.3	1.7	0.78	3.4	4.18	1,504	1509
31-12-2009	43.3	10.0	0.65	10	10.65	3,833	3846
31-01-2010	42	0.6	1.3	2.5	3.8	1,327	1331
28-02-2010	37.3	1.3	1.478	2.1	3.578	1,109	1113
31-03-2010	38.1	1.2	0.67	6.7	7.37	2,334	2342
30-04-2010	42.3	0.6	3.356	1.8	5.156	1,813	1819
31-05-2010	42.2	0.7	1.5	1.5	3	1,052	1056
30-06-2010	41.7	0.3	5.82	1.7	7.52	2,607	2615
31-07-2010	40.2	0.5	2.8	2.5	5.3	1,771	1777
31-08-2010	39	0.9	2.659	2.8	5.459	1,770	1776
30-09-2010	38.5	0.6	4.42	2	6.42	2,055	2061
31-10-2010	38.3	0.2	7.569	1.1	8.669	2,760	2769
30-11-2010	38.4	1.2	2.467	2.2	4.667	1,490	1495
31-12-2010	38.1	0.9	2.059	1.5	3.559	1,127	1131
31-01-2011	37.5	0.9	1.28	2.1	3.38	1,054	1057
28-02-2011	37.3	1.2	1.478	2.1	3.578	1,109	1113
31-03-2011	38.1	4.0	0.669	6.7	7.369	2,334	2342
30-04-2011	38.4	4.8	0.273	7.6	7.873	2,513	2521
31-05-2011	39.3	4.5	0.158	6.4	6.558	2,142	2149
30-06-2011	40.4	5.0	0.354	7.1	7.454	2,503	2512
31-07-2011	41.1	1.3	3.17	2.8	5.97	2,040	2046
31-08-2011	42.1	1.0	1.986	2.1	4.086	1,430	1435
30-09-2011	43.8	1.9	0.339	2.8	3.139	1,143	1147
31-10-2011	44.9	0.4	2.363	1.1	3.463	1,292	1297
30-11-2011	46.1	0.7	2.31	2.1	4.41	1,690	1696
31-12-2011	47.4	2.0	0.445	2.4	2.845	1,121	1125
31-01-2012	48.5	7.4	0.016	7.8	7.816	3,151	3161
29-02-2012	48.7	8.2	0.455	9.6	10.055	4,070	4084
31-03-2012	47.2	3.5	0.017	5	5.017	1,968	1975
30-04-2012	46	4.6	0.884	7.2	8.084	3,091	3101
31-05-2012	45	1.0	1.766	2.5	4.266	1,596	1601
30-06-2012	44.1	2.4	0.339	3.9	4.239	1,554	1559

Date	Rolling Annual Average Flow	Ammonia [as N]	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	mg/l	lbs/day	lbs/day
31-07-2012	43.6	1.1	2.173	1.9	4.073	1,476	1481
31-08-2012	43	0.0	2.266	1.4	3.666	1,310	1315
30-09-2012	41.4	1.2	2.675	1.6	4.275	1,471	1476
31-10-2012	40.2	5.1	0.92	8.1	9.02	3,014	3024
30-11-2012	38.6	10.0	1.437	13	14.437	4,632	4648
31-12-2012	37	5.6	0.84	8.4	9.24	2,842	2851
31-01-2013	36.1	7.1	0.602	9.5	10.102	3,031	3041
28-02-2013	35.7	8.3	0.393	11	11.393	3,381	3392
31-03-2013	35.7	1.1	2.848	2.1	4.948	1,468	1473
30-04-2013	35.6	1.5	1.58	2.9	4.48	1,326	1330
31-05-2013	35.7	5.6	0.433	8	8.433	2,503	2511
30-06-2013	37	0.9	3.81	2.9	6.71	2,064	2071
31-07-2013	37.8	1.1	2.31	2.9	5.21	1,637	1642
31-08-2013	38	7.5	0.545	10	10.545	3,331	3342
30-09-2013	38.1	16.0	0.23	15	15.23	4,823	4839
31-10-2013	37.9	2.8	2.64	2.2	4.84	1,525	1530
30-11-2013	37.9	0.3	4.539	2.8	7.339	2,312	2320
31-12-2013	37.9	0.4	5.444	3.8	9.244	2,912	2922
31-01-2014	38.5	1.0	0.11	2.4	2.51	803	806
28-02-2014	38.5	2.2	5.29	3.9	9.19	2,941	2951
31-03-2014	38.7	4.1	3.71	6.1	9.81	3,156	3166
30-04-2014	40	3.2	2.871	7.2	10.071	3,349	3360
31-05-2014	41	0.0	2.64	4.5	7.14	2,433	2441
30-06-2014	39.9	0.7	4.241	2.7	6.941	2,302	2310
31-07-2014	39.6	0.4	2.669	1.6	4.269	1,405	1410
31-08-2014	39.4	0.0	3.237	2.1	5.337	1,748	1754
30-09-2014	39.2	0.0	7.363	3.2	10.563	3,442	3453
31-10-2014	39.4	0.0	3.493	2.4	5.893	1,930	1936
30-11-2014	39.5	0.4	3.11	2.2	5.31	1,743	1749
31-12-2014	40	0.8	3.099	4.1	7.199	2,394	2402
31-01-2015	39.7	1.8	3.484	4.1	7.584	2,503	2511
28-02-2015	39.4	2.1	2.41	5.3	7.71	2,525	2533
31-03-2015	39.3	3.8	1.149	5.9	7.049	2,303	2310

Date	Rolling Annual Average Flow	Ammonia [as N]	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	mg/l	lbs/day	lbs/day
30-04-2015	38.8	2.8	1.446	4.1	5.546	1,789	1795
31-05-2015	37.4	2.5	2.062	5.6	7.662	2,382	2390
30-06-2015	37.4	1.8	1.323	5.3	6.623	2,059	2066
31-07-2015	37.1	5.6	3.08	6.2	9.28	2,862	2871
31-08-2015	36.7	0.0	5.16	2.8	7.96	2,428	2436
30-09-2015	36.6	0.4	3.311	4.3	7.611	2,316	2323
31-10-2015	36.2	0.8	4.686	3.5	8.186	2,463	2471
30-11-2015	35.8	0.6	5.96	3.2	9.16	2,726	2735
31-12-2015	35.2	0.9	4.91	2.1	7.01	2,051	2058
31-01-2016	35	1.8	0.088	3.9	3.988	1,160	1164
28-02-2016	35.5	3.4	1.51	7.1	8.61	2,541	2549
31-03-2016	35.3	2.7	2.379	4.5	6.879	2,018	2025
30-04-2016	34.5	3.2	0.935	3.2	4.135	1,186	1190
31-05-2016	34.3	0.0	2.043	2.8	4.843	1,381	1385
30-06-2016	33.6	0.7	0.989	3.5	4.489	1,254	1258
31-07-2016	33.1	0.5	0.88	5.8	6.68	1,838	1844
31-08-2016	33.1	0.8	1.431	3.4	4.831	1,334	1334
30-09-2016	32.9	0.0	4.983	6.5	11.483	3,151	3151
31-10-2016	32.9	0.0	1.822	4.5	6.322	1,735	1735
30-11-2016	32.9	1.0	0.455	4.5	4.955	1,360	1360
31-12-2016	32.6	1.8	0.161	2.8	2.961	805	805
Existing Permit Limit	Report	Report	Report	Report	Report	Report	
Minimum	32.9	0.0	0.0	1.0	1.0	410	411
Maximum	56.3	10.0	7.6	13.0	14.4	4632	4648
Average	41.2	1.5	2.6	3.1	5.7	1924	1930
Standard Deviation	4.5	1.8	1.5	2.2	2.2	711	714
No. Measurements	163	163	163	163	163	163	163
No. Exceedances	NA	NA	NA	NA	NA	NA	NA

Administrative Items:

29. **Asset Management:** SWSC understands the importance of an adequate O&M plan, as contained in the draft permit Part D.b, page 16 of 24. However, even the best O&M plan will not prevent system failures, mechanical breakdown or sewer line failure if the infrastructure is beyond its useable life. For this reason, a robust asset management plan is essential.

    Request: SWSC requests that EPA recognize the importance of asset management planning, and include the option for the permittee and co-permittees to include asset management planning as part of their O & M manual.

30. **Submittal of Report Due Dates and as NetDMR Attachments**. Throughout the draft permit are numerous references to annual reports and their due dates. A partial listing is shown below:

Compliance Task	**Annual Due Date**
Design Flow Compliance Report (if annual average flow exceeds 80% of design flow in a calendar year)	April 30
CSO Monthly Inspection Reports	April 30
CSO Monthly Inspection Certification	April 30
Annual Summary Report of Collection System O&M Plan Activities	April 30
Annual Report for 40 CFR Part 503	February 19
Pretreatment Program Annual Report	March 31
Nitrogen Optimization Report	February 1
CSO Abatement Report	April 30

    Request: In order to manage this number of reports and requirements, to the extent feasible, SWSC requests that all annual reports share a common due date of April 30.

    With respect to page 21 of 24 Part I.2, where submittal of reports shall be as NetDMR attachments, please be advised that several annual reports, or the combination of all annual reports on April 30th, may be a large file, and may not be feasible to transmit electronically.

31. **Attachment D Accuracy:** Attachment "D" to the draft permit is a chart showing "CSO overflow events, and volume (in 1,000's of gallons), as reported by SWSC." It appears that the numbers generated are not in 1,000s of gallons, as indicated by the title. For example, 042 at SRWTF in 2016 shows that approximately 6.4 billion gallons of flow was bypassed (6,435,000 x 1,000). EPA should review this chart for accuracy.

32. **Permits Superseded:** In numerous locations throughout the permit and the Fact Sheet, EPA refers to the draft permit superseding the permit signed on December 8, 2000, yet fails to state that the permit also supersedes the CSO permit signed on September 30, 2009.

    Request: The permit and Fact Sheet should clearly identify that both permits will be superseded.

33. **Typographical Error:** On page 14 of 24, section D.2 "Preventative Maintenance," the draft permit states: *"The permittee and co-permittees shall each will maintain an ongoing preventative maintenenace program to prevent…"*
It appears "shall each will" is a typographical error.

    Request: Please revise the language as shown: "The permittee and co-permittees shall each ~~will~~ maintain an ongoing preventative maintenenace program to prevent…"

    Request: SWSC requests that these terms be defined at the Federal level.

34. **Update Administrative Record:** In the Fact Sheet page 8, Part VI, the populations listed for the customer towns is incorrect. The correct population numbers in accordance with the more recent (2010) census data are:

Springfield	154,074
Agawam	28,438
West Springfield	28,391
Ludlow	21,103
Longmeadow	15,784
East Longmeadow	15,720
Wilbraham	14,868
Chicopee [15]	1,000

    Requested Resolution: Please revise the Administrative Record to reflect the updated census data.

SWSC greatly appreciates the opportunity to offer its comments on the draft permit. Please feel free to contact josh.schimmel@waterandsewer.org or call 413-452-1333 if you have any questions about the enclosed information, or if you would like to arrange a meeting to discuss the resolution of the issues raised in this letter.

Sincerely,

_____

Springfield Water and Sewer Commission
Joshua D Schimmel, Executive Director

cc: Fredric P. Andes, Barnes & Thornburg LLP
Dingfang Liu, PhD. PE, Kleinfelder
Administrator, Town of Agawam
Administrator, Town of East Longmeadow
Administrator, Town of Longmeadow
Administrator, Town of Ludlow
Administrator, Town of West Springfield
Administrator, Town of Wilbraham

[15] Estimated population served by SWSC

33. **Typographical Error:** On page 14 of 24, section D.2 "Preventative Maintenance," the draft permit states: *"The permittee and co-permittees shall each will maintain an ongoing preventative maintenenace program to prevent…"*
It appears "shall each will" is a typographical error.

Request: Please revise the language as shown: "The permittee and co-permittees shall each ~~will~~ maintain an ongoing preventative maintenenace program to prevent…"

Request: SWSC requests that these terms be defined at the Federal level.

34. **Update Administrative Record:** In the Fact Sheet page 8, Part VI, the populations listed for the customer towns is incorrect. The correct population numbers in accordance with the more recent (2010) census data are:

Springfield	154,074
Agawam	28,438
West Springfield	28,391
Ludlow	21,103
Longmeadow	15,784
East Longmeadow	15,720
Wilbraham	14,868
Chicopee [15]	1,000

Requested Resolution: Please revise the Administrative Record to reflect the updated census data.

SWSC greatly appreciates the opportunity to offer its comments on the draft permit. Please feel free to contact josh.schimmel@waterandsewer.org or call 413-452-1333 if you have any questions about the enclosed information, or if you would like to arrange a meeting to discuss the resolution of the issues raised in this letter.

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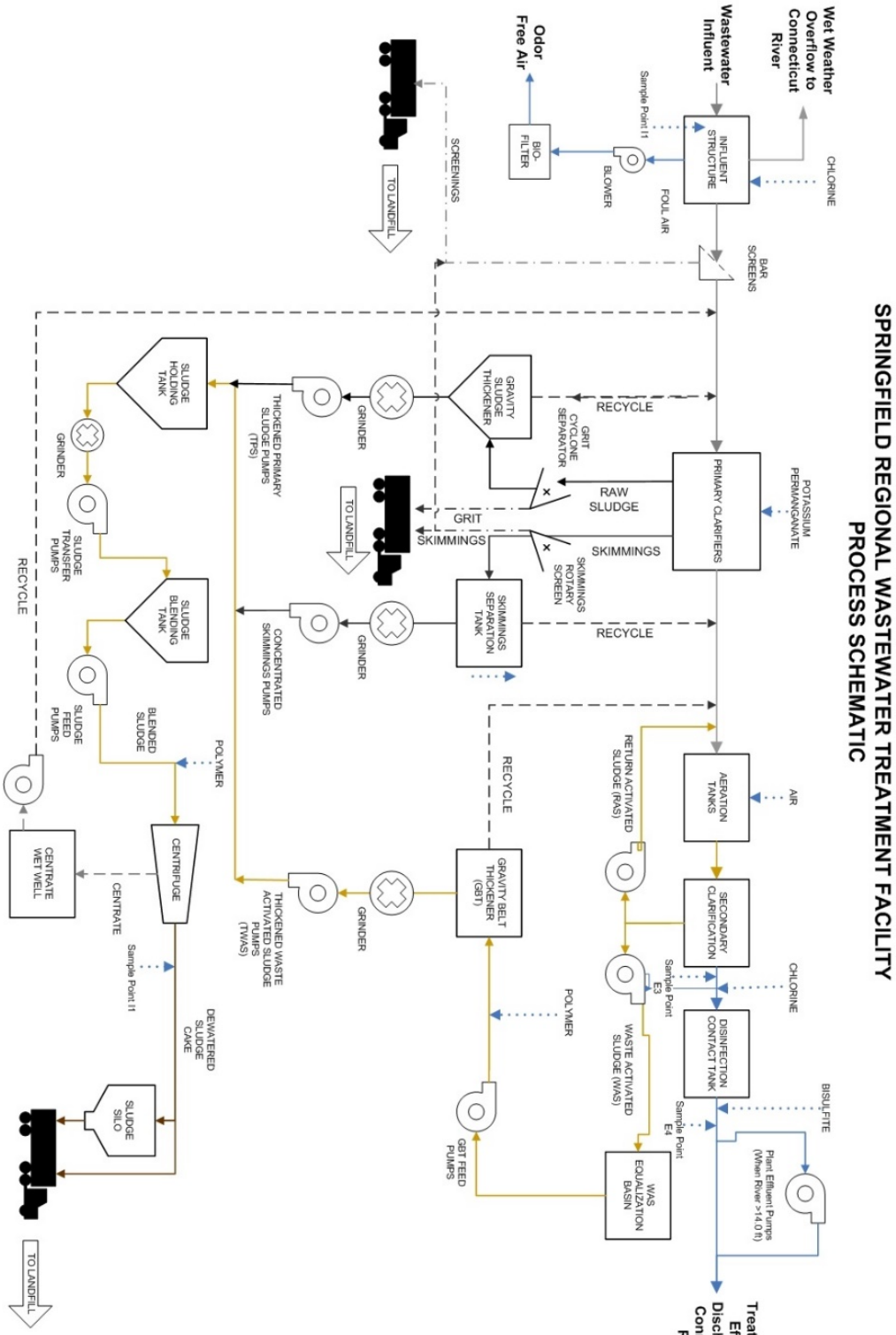
Administrator, Town of West Springfield
Administrator, Town of Wilbraham

[15] Estimated population served by SWSC

ATTACHMENT A



ATTACHMENT B

SRWTF Design, Upgrade and Operation Mode History

The SRWTF currently has a design secondary treatment capacity of 67 MGD. The facility is currently operating at approximately 65% capacity, with average annual daily flows ranging from 30-50 MGD. The facility includes the following processes:

Primary treatment:

- Wastewater influent flow enters the SRWTF through the inlet structure and travels by gravity through four 66-inch channels into the screening facility
- In the screening facility, screenings are removed with four ½" mechanical bar screens with rakes.
- The screened wastewater flows by gravity to four primary settling basins where floating and settleable solids are removed. Grit is settled at the upstream section of the primary settling basin and separated in a cyclone separator prior to disposal off site.
- The heavier grit is pumped via air lift pumps to grit classifiers, and the primary sludge is pumped to the dewatering facility.
- After a portion of the solids are removed in the primary settling basins, the supernatant flows by gravity to the aeration basins for biological treatment.

Secondary treatment:

- The secondary biological treatment process includes a pre-anoxic zone and 3 aeration zones.
- The activated sludge flows by gravity to the final clarifiers where it settles and is removed through pumping. The settled sludge is returned to the anoxic zone at the head of the aeration basins, while wasting a fraction which is sent to solids processing units where it is dewatered and transported off-site for disposal.
- The operator currently maintains a dissolved oxygen concentration of less than 0.5 mg/L in the second aeration zone (swing zone) and step-feeds a small percentage of primary effluent to improve the denitrification performance.
- The treated effluent flows by gravity through a 9-foot diameter pipe to the influent channel of the Chlorine Contact Tank (CCT).
- Flow travels to the end of the basins in the CCT, then out to the Connecticut River via gravity or pumping, depending upon the height of the river at the outfall location.

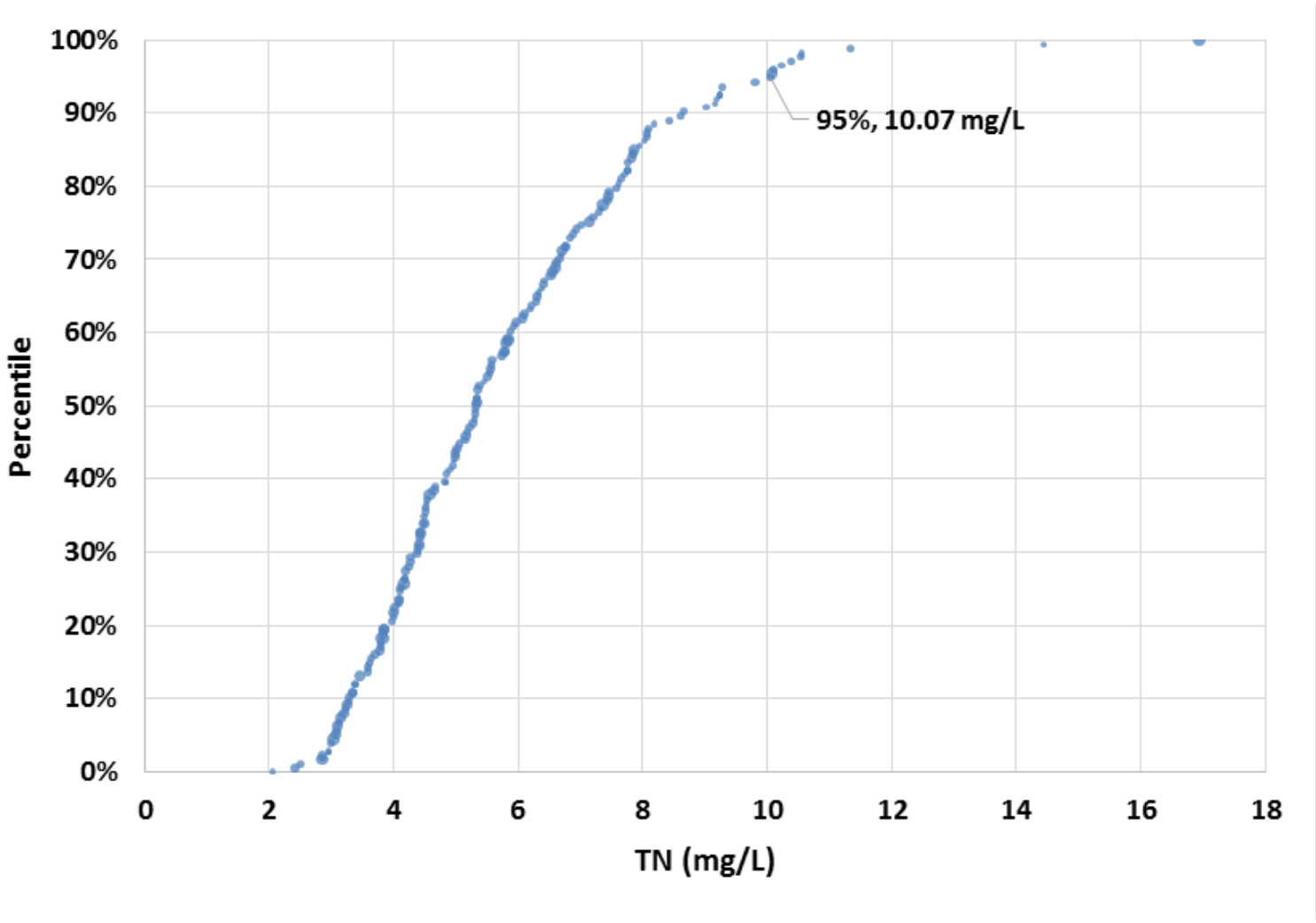
The SRWTF was constructed in the 1940's to treat wastewater with primary clarification, and has undergone several upgrades since:

- Upgrades in 1975 included secondary activated sludge treatment to comply with the Clean Water Act of 1972. Much of the current plant infrastructure from this upgrade is still in service.
- Various treatment processes have been upgraded to improve solids handling, odor control and an aeration system for the activated sludge process.
- The most significant upgrade since 1975 was the conversion to fine bubble diffusion for the aeration tanks and the addition of the Blower Building in 1995. This upgrade also modified the biological process from an extended aeration activated sludge process to the Ludzack-Ettinger (LE) process, a BNR process that includes a pre-anoxic zone for denitrification.

Since September 2015, the plant operator reduced SRT from 30 to 50 days to currently around 19 days and reduced mix liquor suspended solids (MLSS) from more than 3,500 mg/L to typical less than 2,500 mg/L.

ATTACHMENT C

Statistical Analysis of SRWTF Effluent TN Concentrations



ATTACHMENT D

Literature Review of Benchmarking for BNR Performance Assessment

Stantec

Memo

To:	Springfield Water and Sewer Commission	From:	Art Umble/Stantec Chris Andres/Stantec
		Date:	February 1, 2018

Reference: **Nitrogen Removal Benchmark Memorandum**

BACKGROUND INFORMATION

Nutrients are substances essential to the survival, growth, and reproduction of living organisms. In aquatic environments, nitrogen and phosphorus are the most important nutrients because they are critical in the aquatic life that sustains ecosystems. When available, nutrients are incorporated into individual cells as "food" for energy and growth. However, excessive amounts of nitrogen and phosphorus in aquatic environments can lead to a form of nutrient pollution known as eutrophication. This is a condition whereby excessive production of algae is stimulated. When the algal mass dies, available oxygen is consumed, significantly degrading the quality of the water. This degradation threatens survival of aquatic life, and, can impact public health—such as when the water is a source for drinking or supports contact recreation.

Eutrophication most notably is recognized in the formation of "dead zones" along coastal areas such as the Gulf of Mexico, Chesapeake Bay, Puget Sound, Long Island Sound, and Cape Perpetua, areas where major rivers, carrying large loads of nutrients, discharge. This can result in significant negative impact on local/regional tourism and commercial fisheries. Regardless of location, eutrophication always results in visually unappealing and odorous waters which negatively impact perceptions of a community's quality of life. Therefore, nutrient pollution has cascading public health, economic, and societal impacts.

Agency authorities responsible for protecting water quality, such as the Environmental Protection Agency (EPA), have taken steps to combat nutrient pollution through regulation. One such requirement is the Total Maximum Daily Load (TMDL) Program, which specifies a maximum amount of pollutant permitted to enter and be assimilated by a receiving waterbody, such that the waterbody sustains the minimal (or better) standard of water quality required to achieve the designated uses for that waterbody (e.g., drinking water supply, contact recreation, fishery, navigation, irrigation supply, etc.). According to the Clean Water Act (CWA), all States must periodically assess their waterbodies, and identify those that do not meet minimum water quality standards necessary to support their designated uses. For those that do not, they are labeled as "impaired" and placed on the State's list of impaired waters, known as the "303(d) List" (which corresponds to said section in the regulations). States must develop TMDLs for all waters identified on their prioritized 303(d) lists. A TMDL calculates the maximum allocation of pollutant load that may be discharged into the impaired waterbody from both point and non-point sources. The intended outcome is that the minimum water quality necessary to support the designated uses for that waterbody is restored, allowing the waterbody to once again support those uses.

The Long Island Sound is a waterbody whose water quality has been assessed as impaired due to excessive loads of nitrogen. This has resulted in a TMDL being imposed on the waterbodies tributary to the Sound which includes the Connecticut River. Therefore, NPDES permit holders along the Connecticut River are subject to the requirements of the TMDL. .

Numerous technologies are available for controlling nutrient pollution at point sources, with biological methods being the most common for municipal waste streams. An effective biological treatment system hinges on creating/maintaining environmental conditions favored by the microbial communities of interest. Removal of nitrogen from municipal wastewater is most commonly accomplished biologically, via the activated sludge process operating with a nitrification and denitrification mode. First, as shown in Table 1, is the nitrification step. During nitrification, a community of specific microorganisms (known as nitrifiers) transform ammonia—the dominate form of nitrogen in municipal wastewater—into nitrate. The denitrification step follows and transforms the nitrate into nitrogen gas which escapes innocuously to the

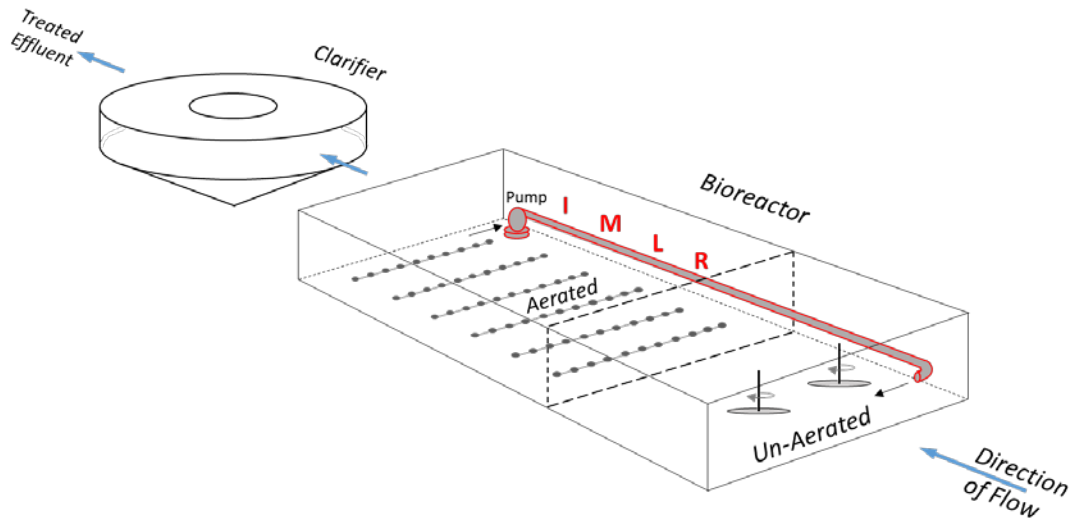
atmosphere. With the conversion to nitrogen gas, the associated nitrogen is completely removed from the wastewater stream. An essential fact is that nitrification occurs only in the presence of oxygen, while denitrification only occurs when oxygen is absent. The manner in which these two environments are established and controlled within the treatment process is fundamental to the nitrogen removal efficiency. Other parameters such as pH, temperature, carbon availability, etc. have a significant influence on the removal performance as well.

Many configurations of the activated sludge process have been developed to achieve different water quality goals. The most common for nitrogen removal is the Modified Ludzack-Ettinger (MLE) configuration. Figure 2 illustrates this configuration. As shown, it includes a bioreactor with two distinct zones, an un-aerated zone followed by an aerated zone, along the direction of flow. Denitrification occurs in the un-aerated zone (absence of oxygen) while nitrification occurs in the aerated zone (oxygen present). The defining feature of the MLE configuration is the internal mixed-liquor recycle (IMLR) stream which recirculates nitrate from the aerated zone back to the un-aerated zone at the head of the bioreactor, where it can be converted to nitrogen gas and released to the atmosphere.

Table 1 – Summary of Key Process Steps of Biological Nitrogen Removal

	Step 1	Step 2
Process Step/Name	Nitrification	Denitrification
Objective	Convert ammonia to nitrate	Convert nitrate to nitrogen gas
Required Environment	Aerated (Oxygen must be present)	Un-aerated (Oxygen must be absent))

Figure 2 – Conventional MLE Process Schematic for Nitrogen Removal



LITERATURE REVIEW

This literature review was conducted to support Springfield Water and Sewer Commission's (SWSC) ongoing NPDES permit negotiations as it relates to nitrogen removal benchmarking. Specifically, it is intended to:

- Provide evidence that performance of process technologies is typically evaluated by effluent concentration (as opposed to effluent load) of the targeted compounds, e.g. BOD, TSS, NH3-N. SWSC's goal is to use effluent TN concentration as benchmark for performance evaluation/ optimization.
- Quantify the "typical" performance of BNR systems employing the Ludzack-Ettinger (LE) process configuration in terms of achievable effluent concentration, and to validate that a criterion of 8 mg/L TN is an appropriate effluent benchmark.

Review of available material/literature indicates that effluent concentration of priority constituents (e.g. BOD, TSS, NH3-N) is an established key parameter in the design, operation /control, and evaluation of wastewater treatment processes that discharge treated effluents to Waters of the US. Effluent concentration is used as an important process criterion and is referenced in EPA guidance material, standard design texts, operation manuals, and research literature. Key observations from a range of literature review sources are summarized below:

- EPA process control manuals for activated sludge systems recommend monitoring effluent concentration and removal efficiencies, in combination with other critical operation parameters such as SRT, RAS/WAS rates, solids inventory, aeration demand, etc. This data is critical to assessing performance in response to various modes of operation, for developing performance trends, and identifying causes of operational problems. (EPA, 1977)
- For facilities that are required to nitrify/denitrify, AWWA-WEA manuals for WWTP optimization assessments recommend establishing effluent concentration targets and sampling/monitoring procedures for NH3-N and NOx. Other critical parameters identified include SRT, aeration tank DO, aeration tank MLSS, and RAS/WAS flow and concentration. (AWWA, 2017)
- Fact Sheets prepared by EPA, intended to provide information on the types of available BNR technologies, consistently utilize and reference TN and TP effluent concentration when identifying/expressing achievable performance. (EPA, 2007)
- Fact Sheets prepared by EPA cite that appropriate BNR system selection depends on the target effluent concentrations. (EPA, 2007)
- Design manuals published by EPA recommend that target effluent concentrations, including TN and TP be considered when establishing treatment objectives for BNR systems. (EPA, 2010)
- Design manuals published by EPA discuss available treatment technologies and express general effluent quality in terms of effluent concentration. (EPA, 2010)
- Research literature related to assessing/quantifying liquid stream process performance consistently expresses treatment capability in terms of effluent concentration and percent removal.

Review of available material/literature indicates that available process data quantifying the performance of the LE configuration is very limited. This is likely due to the relatively short period of time the process was utilized before becoming obsolete due to the introduction of the MLE, which incorporated an internal nitrate recycle resulting in significant improvement in nitrogen removal treatment. Contrary to the LE, the MLE process has become today's most widely-used BNR technology for nitrogen removal. This is primarily due to its relatively simple design and operation and lower capital costs. Development of other nutrient removal processes such as the 4-Stage Bardenpho, Step-Feed BNR, A/O, A2/O, JHB, UTC, and MUCT, were developed in the 1970s and 80s following full adoption of the MLE technology in the industry. These enhanced configurations were developed for full BNR functionality, meaning capable of either, or both, nitrogen and phosphorus removal at higher performance levels. Each incorporates a form of the MLE as its core nitrogen removal step[1]. As such, there is much data available describing its performance and associated costs. Key observations from a range of literature review sources are summarized below:

- EPA studies evaluating available BNR technologies, achievable treatment, and associated costs identify the MLE process can typically achieve an effluent concentration of 3– 10 mg/L TN, with an average of 6 mg/L TN. (EPA, 2007)
- EPA BNR design manuals and technology summary reports identify that MLE process is capable of approximately 80% removal TN, corresponding to 5-8 mg/L TN. (EPA, 2010)

[1] With the exception of A/O which is designed for phosphorus removal only.

- Industry-standard design references identify that the MLE process can typically achieve 85% removal TN, corresponding to an effluent concentration of 5-8 mg/L TN. (Metcalf and Eddy, 2004)
- BNR processes with one anoxic zone typically produce effluents with total nitrogen concentrations ranging between 5 and 10 mg/L as N, while processes with two anoxic zones typically produce effluents with concentrations ranging between 1.5 and 4 mg/L as N. (L. Grady, 2011) (Sedlak, 1991)
- An EPA report studying the performance and associated costs of BNR treatment identified that facilities that utilize MLE typically produced effluent concentrations ranging from 3-5 mg/L TN. This study examined 370 facilities with design capacities ranging from 0.1-863 MGD from across the USA. The same report identified that BNR facilities producing effluent quality of 2.0-16.4 mg/L TN required capital costs ranging from $0.1 – 22.17/gpd; and annual O&M costs ranging from $0.02-0.51 $/gpd/year. (EPA, 2015)

As noted, the key difference in the LE vs the MLE process is the internal nitrate recycle stream in the MLE, to enhance denitrification. Typically, this stream is 2-4X the flow rate of raw wastewater entering the bioreactor. The impact of the recycle stream on effluent TN concentration can be quantified by developing a process model, adjusting the internal recycle stream, and observing the impact on TN in the bioreactor effluent. This was simulated in Biowin™ (commercial process simulation software) using standard domestic wastewater characteristics and typical MLE design criteria. With other key parameters held constant, this change resulted in a 23% increase in TN in the final effluent[2]. Based on this analysis, if a typical MLE process is capable of reliably producing 7-10 mg/L TN effluent (conservative values as reported in literature[3]), mathematically, then, an LE process should be capable of producing roughly 9-12 mg/L TN effluent.

The achievable effluent limits from this high-level modeling approach should be taken as general guidance. Though literature reports values as low as 3 mg/L for the MLE under specific conditions typically for a short period time, the reality of full-scale operations tend to show reliable performance levels at the upper ends of these ranges (7-10 mg/L). The performance of BNR systems depend greatly on the influent COD fractionation of the individual wastewater streams. With ideal wastewater fractionation and proper design, an LE process could occasionally produce effluent at approximately 4 mg/L TN or less. However, none-ideal fractionation or moderately-favorable fractionation with poor design can limit achievable effluent quality to the upper range of the technology (approximately 12 mg/L TN or greater). Realistically, an LE process would rarely be capable of reaching these single digit nitrogen levels even when carbon stoichiometry is favorable because the majority of nitrate is always lost via the effluent, with only minimal amounts returned in the RAS. Moreover, the importance of proper O&M should not be overlooked. BNR system performance is sensitive to changing process conditions responding to variability in the flows and loads that happen daily, as well as seasonally. Performance of even the best-designed processes will be limited without sufficient O&M resources to monitor, control, and maintain the systems.

CONCLUSIONS

This literature review indicates that utilizing effluent concentration (in lieu of effluent loading) as a benchmark for process performance evaluation and optimization is a technically sound approach consistent with industry standards. Based on the performance data available in the literature, typical LE process could not consistently achieve an effluent concentration lower than 8 mg/L TN because of the physical limitations imposed by its configuration. Therefore, if an

[3] It should be noted that the efficacy of the biological removal of nitrogen is a function of readily degradable carbon made available to denitrifying organisms in anoxic environments. Therefore, the ultimate performance of an MLE process at any given facility will be determined more from the site-specific characteristics of the raw wastewater entering that facility than from the internal nitrate recycle within the MLE. However, control of the internal nitrate recycle rate is a tool by which to optimize the extent of carbon utilization for optimal denitrification rates to maximize TN removal at a given facility.

[3] Reported effluent TN concentrations as low as 3 mg/L for MLE processes was observed in the literature review (EPA, 2007). While not explicitly reported, it is suspected that this level of treatment was achieved under very controlled conditions and or by utilizing MLE in combination with another technology such as an IFAS, MBBR, supplemental carbon, etc.

optimization target of 8 mg/L TN effluent concentration is established, plants utilizing the LE process will likely require modifications to operate in different process configuration.

The addition of the internal nitrate recycle to the LE process to form the "Modified LE" (MLE) process greatly enhances the total nitrogen removal capacity and reliability in performance. Because of this, the MLE has continued to function as the core nitrogen removal component of all BNR technology developments. As a result of decades of operational performance data from many BNR plants around the world, it is now generally accepted that the MLE process can consistently achieve an effluent TN concentration of 8 mg/L, assuming favorable organic carbon stoichiometry conditions in the raw wastewater, a condition that is generally met with municipal wastewaters.[4] Therefore, the proposed target effluent concentration of 8 mg/L TN is consistent with literature, and would seem to be an appropriate for defining the "total nitrogen removal performance limit" for the MLE process technology.

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[4] As a general rule, a "favorable" stoichiometric condition for reliable nitrogen removal is defined when the influent COD/TN ratio is at 10 or higher. When this ratio is less, which can be the case with more dilute wastewater streams (due to high I&I, or in combined sewer systems), some form of supplemental carbon is typically then required to establish favorable conditions.

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ATTACHMENT E

SRWTF Influent Hydrograph from 2004 to 2016