



Haverhill

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July 22, 2019

VIA E-Mail

Evan Lewis, Lewis.Evan@epa.gov
United States Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

RE: City of Haverhill Water Pollution Abatement Facility (WPAF)
Comment on NPDES Draft Permit MA0101621

Dear Mr. Lewis:

The City of Haverhill (City) respectfully submits the enclosed comments on the draft National Pollutant Discharge Elimination System (NPDES) permit (Draft Permit) issued by the United States Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (MassDEP) on June 7, 2019 for the City of Haverhill Water Pollution Abatement Facility (WPAF) and its Combined Sewer Overflow (CSO) discharges. Due to the significant impact the Draft Permit will have on future compliance strategies, capital investment, and overall affordability, the City developed the detailed comments below in conjunction with its consultants, Kleinfelder and Osprey Owl and its attorneys, Nutter, McClennen and Fish LLP, to provide its full perspective on the Draft Permit prior to finalization by EPA and MassDEP. The City welcomes and appreciates any opportunity to work with EPA and MassDEP to resolve the issues identified in these comments prior to the issuance of a final permit.

As discussed below, the City has significant comments on the Draft Permit and requests that EPA revise and re-issue the Draft Permit for further comment. The City believes, as stated in its letters to EPA requesting a delay in issuance of the Draft Permit and extension of the Comment Period, that more time is necessary to provide an appropriate and effective permit that serves the environment and the City's ratepayers. As EPA is aware, when the City was first informed of the intent to issue the Draft Permit, it notified EPA that the permit process would benefit from a pause in the process during the low flow period for the Merrimack River, to collect and provide more accurate sample data on which to base new effluent limits. While the City appreciates the two-week extension to provide its comments, we believe that a permit of this significance requires a more deliberative process to collect and analyze the data and proposed permit conditions.

Background

The City owns and operates both the WPAF and thirteen CSO outfalls within its service area, which includes the City, which is an environmental justice community, and the Town of Groveland. Currently, the WPAF and the CSO outfalls are regulated by NPDES Permit No. MA0101621 (issued on December 5, 2007). When finalized, the Draft Permit will supersede the 2007 NPDES Permit currently in effect. The City is considered a small community under EPA's CSO Policy.

The City also notes that in addition to the named permittee (the City); the Draft Permit is also issued to the Town of Groveland as a co-permittee. It is the City's understanding that any support for these comments or additional input from the co-permittee will be issued in a separate document.

guidance documents, but the City may, on a limited basis, solicit input from the surrounding community. A public notification plan will only be meaningful to the extent that it addresses the needs of the community.

However, the development and implementation of an extensive public notification plan, particularly the implementation of a web-based notification system, cannot be achieved within 180 days. This is simply insufficient time to develop a meaningful plan, solicit appropriate input, determine the content and extent of appropriate notification, develop a notification system that evaluates public posted signs and the needs for additional public postings, plus other contents of a meaningful public notification plan.

Notwithstanding the significant degree of effort involved in developing the web-based notification system, the City and the Commonwealth of Massachusetts procedures for bidding and procurement are extensive and require adequate time for each phase of the design, construction bidding, award, and implementation process. These procedures include but are not limited to budgeting and obtaining funding, procurement of engineering services to assist in the program development and design, development and bidding plans and specifications, advertising and bidding process, and contract award – all of which must occur prior to beginning work on the contract.

Request: The City requests that submittal and implementation of a public notification system be extended to 36 months following the effective date of the final permit. The City also requests that the requirement for initial notification of probable CSOs be struck from the Draft Permit and that notification of a CSO event will be made to the public to the extent practicable when the City becomes aware that a CSO discharge has occurred.

14. **CSO Outfall Monitoring:** Part 1.F.5 of the Draft Permit requires that monitoring be conducted and reported for “number of hours” of CSO discharge. The duration in hours of a CSO event does not provide meaningful data to the EPA or to the public. For example, a large volume CSO discharge that is flowing at the rate of 10,000 gallons per minute for one hour, has a much greater impact than a CSO discharge that is flowing at the rate of 1 gallon per minute for 24 hours. We question EPA as to what meaningful metric duration of flow in hours provides?

The City notes the flow hours are not readily available on a daily basis. The City already provides this information to EPA and MassDEP on an annual basis and agrees to continue such reporting.

Whereas total volume of a CSO event may provide a meaningful metric to measure future reductions and trends, hours of duration has no meaning unless it is associated with velocity, and the measure of velocity with duration, gives one volume of discharge – which is already required.

Request: The City requests that duration of CSO flow in hours duration be eliminated or in the alternative that the City may propose alternative monitoring and reporting options in the future.

15. **Dilution Factor:** The Draft Permit Fact Sheet calculated the dilution factor based on U.S. Geological Survey gage station (#01100000) in the area of the Merrimack River in Lowell, MA. The City has found several concerns on the calculation as described below.

- a) Smaller Number of Dataset Used to Calculate 7Q10 Causes Higher Uncertainty in Statistical Analysis: EPA extrapolated 7Q10 flow from a portion of USGS data set of river daily discharge data (January 1989 to October 2017) as stated in 2019 Fact Sheet page 14 of 41. It is unclear why this 30-year period was selected even though USGS data set included data from June 1923 to December 2018.

The statistical estimate of 7Q10 flow was based on log Pearson Type III distribution to fit the return frequency curve with annual 7-day low flow data. For statistical analysis, the larger the dataset available, the greater the certainty of the estimated value. The Figure below shows the annual 7-day low flow values from 1923 to 2018. There is no observable trend over the entire 95-year period.

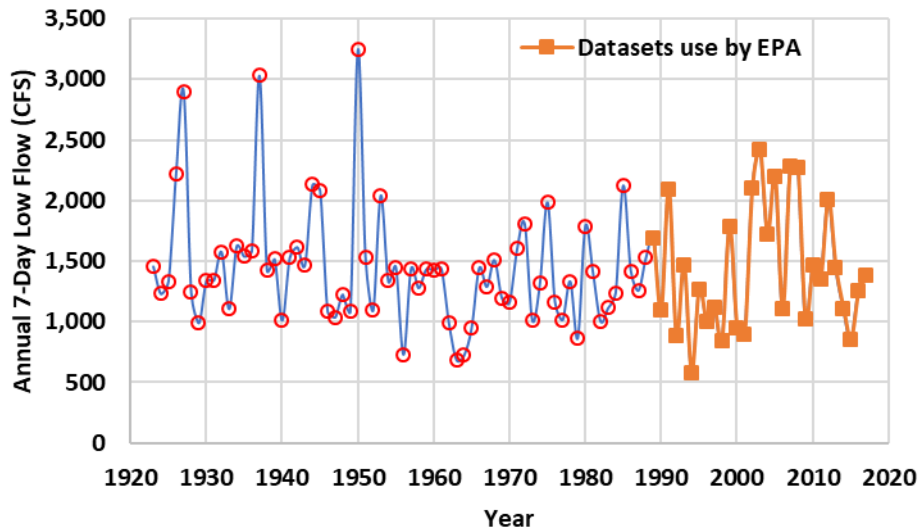


Figure 1. Annual 7-Day Low Flows from 1923 to 2018.

Table below compares 95 percent confidence intervals with Log Pearson Type III distribution analysis using entire 95 years of data versus only using most recent 30 years of data. The comparison indicates that using a smaller sample number in deriving the 7Q10 results in much higher uncertainty (reflected in a much higher discrepancy over the 95 percent confidence interval (from 637.500 to 988.060 cfs). The Log Pearson Type III analysis results are included in Attachment 2.

Table 3 Summary of Confidence Interval Estimates of 7Q10 Flow.

	95 percent confidence intervals estimate of 7Q10 flow (CFS)	
	Lower	Upper
Entire USGS Data (95 Years)	826.330	979.240
Most Recent 30 Years' Data	637.500	988.060

Request: To provide a more accurate estimate of 7Q10 flow with less uncertainty, EPA should use all river discharge data available (June 1923 to December 2018) for USGS gage (#01100000). It is also consistent with the example described in EPA’s Handbook for NPDES Permit Writers for calculating the 7Q10².

² US EPA, Office of Water, *Low Flow Statistics Tools, A How-To Handbook for NPDES Permit Writers*, EPA-833-B-18-001, October 2018.

- b) Calculated 7Q10 Provided in the Draft Permit at USGS Gage Station (#01100000) is Incorrect: EPA provided a 7Q10 flow of 832 cfs in 2019 Fact Sheet page 14 of 41. However, there is no description of how this value was estimated. Based on the methodology described in EPA’s 2018, Low Flow Statistics Tools, A How-To Handbook for NPDES Permit Writers and USGS’ SW Toolbox software, the City recalculated the 7Q10 value for the USGS gage station (#01100000) with all available data. The 7Q10 for this gage station is estimated to be 907.33 cfs as illustrated in Figure 2 below as well as shown in Attachment 2.

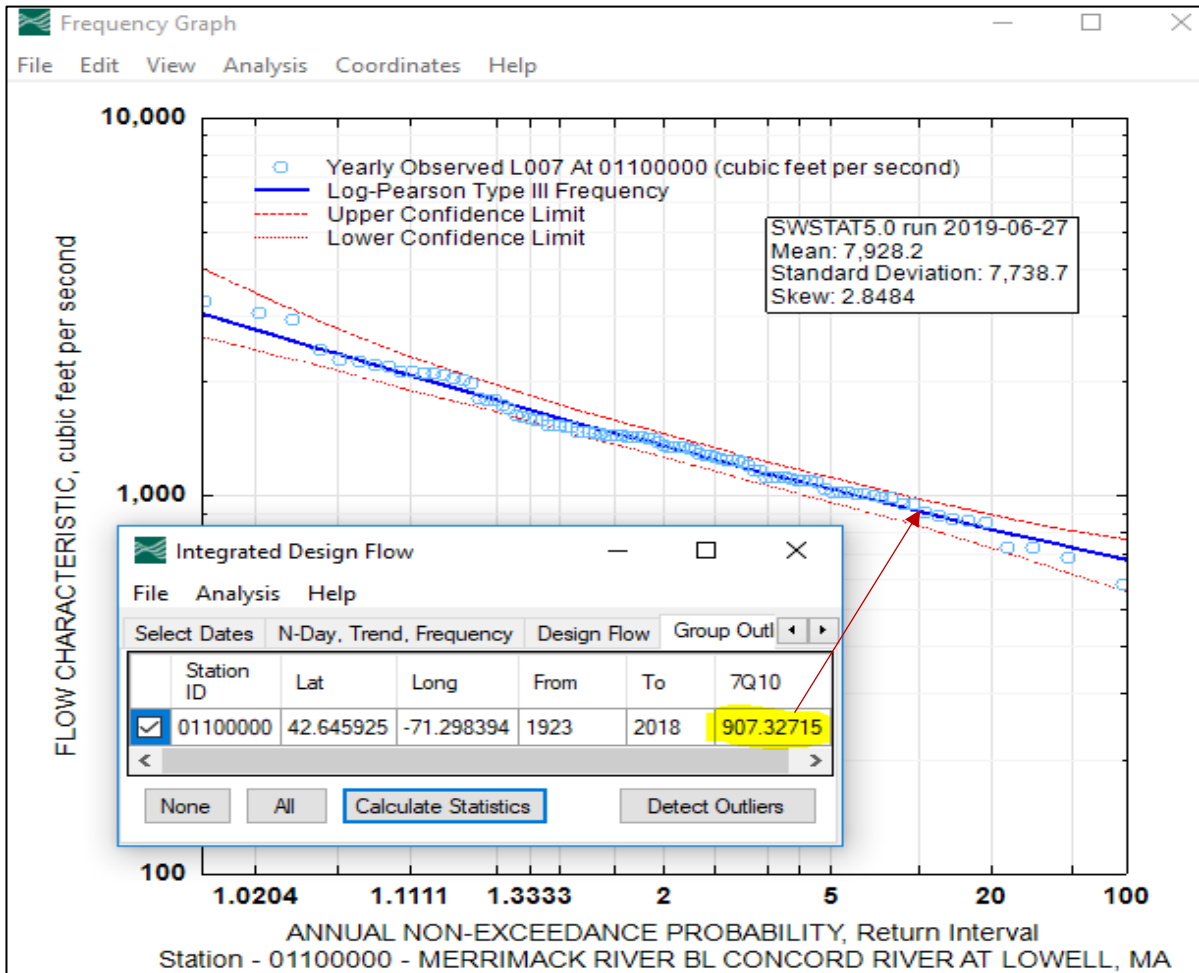


Figure 2 Low Flow Return Frequency Statistical Graph for USGS Gauge Station 01100000 Using USGS SW Toolbox Version 1.0.4³. The calculated 7Q10 flow is 907.33 cfs. The Analytical processes are based on EPA’s Handbook for NPDES Permit Writers.

Request: Based on EPA’s Handbook for Permit Writers on estimating 7Q10 value, the City has calculated 7Q10 value for USGS gage station (#01100000) to be 907.33 cfs. The City requests that EPA replace the 7Q10 value with updated estimation of 907.33 cfs.

³ <https://www.usgs.gov/software/swtoolbox-software-information>

- c) The Drainage Basin Area for USGS Gage Station (#01100000) is Incorrect. The Draft Permit provided drainage area at the gage to be 4,635 square miles. However, communication with USGS’ Richard J. Verdi, Chief of Hydrologic Surveillance and Surface Water Investigations, found that, “*The National Water Information System webpage indicates the total drainage area above the gage is 4,635 mi², of which 214 mi² are used for Boston and Worcester. This nets 4,412 mi² that flows beyond the gage to Lawrence.*” The email communications with USGS are included in Attachment 3.

Request: Based on USGS’ estimation of the drainage area that impact Lawrence at USGS gage station (#01100000), the drainage area for calculation of low-flow factor should be 4,412 square miles. Therefore, the flow factor for USGS #01100000 should be 0.2057 cfs/sq. mi:

$$\text{Flow factor for USGS \#01100000} = \frac{907.33 \text{ cfs}}{4,412 \text{ square miles}} \approx 0.2057 \frac{\text{cfs}}{\text{sq. mi}}$$

Given the drainage area upstream of the WPAF effluent discharge outfall is about 4,880 square miles, the 7Q10 flow at the outfall should be 1,002 cfs or 647 million gallons per day (MGD).

The dilution factor (DF) at the 7Q10 flow of 647 MGD in the receiving water upstream of the discharge, Q_s , and the Facility’s design flow of 18.1 MGD, Q_d , should be calculated as 36.7:

$$DF = (Q_s + Q_d)/Q_d = (647 \text{ MGD} + 18.1 \text{ MGD})/18.1 \text{ MGD} = 36.7$$

Request: The City requests that EPA rerun the reasonable potential analysis as well as the calculation of all flow dependent effluent limitations and conditions in the Draft Permit using the corrected instream dilution factor of 36.7 along with any other correspondingly adjusted values for other critical flow conditions used.

16. **Total Residual Chlorine:** The Draft Permit has reduced the City’s effluent limitation for Total Residual Chlorine (TRC) from 0.4 mg/L as a monthly average and 0.7 mg/L as a daily maximum to 355 µg/L as a monthly average and 614 µg/L as a daily maximum. This change in effluent limitation was based upon the revised dilution factor.

Based on the analysis described in item #15 above, the correct dilution factor should be 36.7. Therefore, the total residual chlorine should also be calculated with this dilution factor.

Request: The water quality-based chlorine limits should be calculated as follows:

$$\begin{aligned} \text{Chronic limit} &= \text{Chronic criteria} \times \text{dilution factor} \\ &= 11\mu\text{g/L} \times 36.7 = 404 \mu\text{g/L} \end{aligned}$$

$$\begin{aligned} \text{Acute limit} &= \text{Acute criteria} \times \text{dilution factor} \\ &= 19\mu\text{g/L} \times 36.7 = 697 \mu\text{g/L} \end{aligned}$$

17. **TRC Continuous Monitoring:** Footnote 8 to Part I.A of the Draft Permit requires that the City report the average monthly and maximum daily TRC using data collected by a continuous TRC analyzer. “The Permittee shall substitute the average of three TRC grab samples per day, for any day that they are unable to comply with the continuous reporting requirement discharge.” However, in the past the City has encountered issues with the reliability of continuous TRC