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

FACT SHEET

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

NPDES PERMIT NUMBER: NH0100447

PUBLIC NOTICE START AND END DATES: April 10, 2024 – May 10, 2024

NAME AND MAILING ADDRESS OF APPLICANT:

City of Manchester
300 Winston Street
Manchester, NH 03103

and

15 Combined Sewer Overflow (CSO) Outfalls

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Manchester Wastewater Treatment Facility
300 Winston Street
Manchester, NH 03103

The Towns listed below are co-Permittees for activities required in Part I.B. (Unauthorized Discharges), Part I.C. (Operation and Maintenance of the Sewer System) and Part I.D. (Alternate Power Source):

NHC010447	NHC020447	NHC030447
Town of Bedford 24 North Amherst Road Bedford, NH 03110	Town of Goffstown Goffstown Sewer Commission 16 Main Street Goffstown, NH 03045	Town of Londonderry 268 B Mammoth Road Londonderry, NH 03053

RECEIVING WATERS AND CLASSIFICATION:

Merrimack River (NHRIV700060803-14-02 and NHIMP700060802-04)
Piscataquog River (NHRIV700060607-22)
Baker Brook (NHRIV700060803-08)
Rays Brook (NHRIV700060802-15)
Unnamed Brook (NHRIV700060803-17)
Merrimack River Watershed - All Class B

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Appendices

1.0 Proposed Action

The above-named applicant (the Permittee) has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge from the Manchester Wastewater Treatment Facility (the Facility) into the designated receiving waters shown on Page 1 of this Fact Sheet.

The permit currently in effect was issued on February 11, 2015 with an effective date of May 1, 2015 and expired on April 30, 2020 (the 2015 Permit). The Permittee filed an application seeking NPDES permit reissuance from EPA dated October 30, 2019, as required by 40 Code of Federal Regulations (CFR) § 122.6. Since the permit application was deemed timely and complete by EPA on March 3, 2020, the Facility's 2015 Permit has been administratively continued pursuant to 40 CFR § 122.6 and § 122.21(d). EPA and the State conducted a site visit on February 5, 2024.

The NPDES Permit is issued by EPA under federal law, New Hampshire construes Title L, Water Management and Protection, Chapters 485-A, Water Pollution and Waste Disposal, to authorize the NHDES to "consider" a federal NPDES permit to be a State surface water discharge permit. As such, all the terms and conditions of the permit may, therefore, be incorporated into and constitute a discharge permit issued by NHDES.

2.0 Statutory and Regulatory Authority for Setting NPDES Permit Requirements

Congress enacted the Federal Water Pollution Control Act, codified at 33 U.S.C. § 1251-1387 and commonly known as the Clean Water Act (CWA), "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except to the extent authorized under specific provisions of the CWA, one of which is § 402. *See* CWA §§ 301(a), 402(a). Section 402(a) established one of the CWA's principal permitting programs, the NPDES Permit Program. Under this section, EPA may "issue a permit for the discharge of any pollutant or combination of pollutants" on the condition that the discharge will comply with the standards specified in certain other provisions of the statute (e.g., CWA §§ 301, 306 and 403). CWA § 402(a)(1). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. *See* CWA § 402(a)(1) and (2). The regulations governing EPA's NPDES permit program are generally found in 40 CFR Parts 122, 124, 125, and 136.

"Congress has vested in the Administrator [of EPA] broad discretion to establish conditions for NPDES permits" in order to achieve the statutory mandates of Sections 301 and 402 of the CWA. *Arkansas v. Oklahoma,* 503 U.S. 91, 105 (1992). Technology-based effluent limitations (TBELs) represent the minimum level of pollutant discharge control that must be satisfied under Sections 301(b) and 402(a)(1) of the CWA. *See also* 40 CFR § 125.3(a). When limits more stringent than technology-based limits are needed to maintain or achieve compliance with state water quality standards (WQS), then NPDES permit must include water quality-based

effluent limits (QBELs). See CWA §§ 301(b)(1)(C) and 401; 40 CFR §§ 122.4(d), 122.44(d)(1) and (5), 124.53, and 124.55.

2.1 Technology-Based Requirements

Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. *See* CWA § 301(b). As a class, publicly owned treatment works (POTWs) must meet performance-based requirements based on available wastewater treatment technology. *See* CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH. *See* 40 CFR Part 133.

Under CWA § 301(b)(1), POTWs must have achieved effluent limits based upon secondary treatment technology by July 1, 1977. Since all statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired, when technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. *See* 40 CFR § 125.3(a)(1).

2.2 Water Quality-Based Requirements

The CWA and federal regulations also require that permit effluent limits based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water. This is necessary when less stringent TBELs would interfere with the attainment or maintenance of water quality criteria in the receiving water. *See* CWA § 301(b)(1)(C) and 40 CFR §§ 122.44(d)(1), 122.44(d)(5).

2.2.1 Water Quality Standards

The CWA requires that each state develop water quality standards (WQSs) for all water bodies within the State. *See* CWA § 303 and 40 CFR § 131.10-12. Generally, WQSs consist of three parts: 1) the designated use or uses assigned for a water body or a segment of a water body; 2) numeric or narrative water quality criteria sufficient to protect the assigned designated use(s); and 3) antidegradation requirements to ensure that once a use is attained it will not be degraded and to protect high quality and National resource waters. *See* CWA § 303(c)(2)(A) and 40 CFR § 131.12. The applicable State WQSs can be found in the New Hampshire Code of Administrative Rules, Surface Water Quality Regulations, Chapter Env-Wq 1700, *et seq*. *See also generally*, N.H. Rev. Stat. Title L, Water Management and Protection, Chapters 485-A, Water Pollution and Waste Disposal.

As a matter of state law, state WQSs specify different water body classifications, each of which is associated with certain designated uses and particular numeric and narrative water quality

criteria intended to help attain the designated uses. Then the state assigns one of the water body classifications to each water body in the state. When using chemical-specific numeric criteria to develop permit limitations, acute and chronic aquatic life criteria and human health criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. In general, aquatic-life acute criteria are considered applicable to daily time periods (maximum daily limit) and aquatic-life chronic criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific human health criteria are typically based on lifetime chronic exposure and, therefore, are typically applicable to average monthly limits.

When permit effluent limitation(s) are necessary to ensure that the receiving water meets narrative water quality criteria, the permitting authority must establish effluent limits in one of the following three ways: 1) based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use," 2) based on a "case-by-case basis" using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, 3) in certain circumstances, based on use of an indicator parameter. *See* 40 CFR § 122.44(d)(1)(vi)(A-C).

2.2.2 Antidegradation

Federal regulations found at 40 CFR § 131.12 require states to develop and adopt a statewide antidegradation policy that maintains and protects existing in-stream water uses and the level of water quality necessary to protect these existing uses. In addition, the antidegradation policy ensures maintenance of high quality waters which exceed levels necessary to support propagation of fish, shellfish, and wildlife and to support recreation in and on the water, unless the State finds that allowing degradation is necessary to accommodate important economic or social development in the area in which the waters are located.

The New Hampshire Antidegradation Policy, found at Env-Wq 1708, applies to any new or increased activity that would lower water quality or affect existing or designated uses, including increased loadings to a water body from an existing activity. The antidegradation regulations focus on protecting high quality waters and maintaining water quality necessary to protect existing uses. Discharges that cause "significant degradation" are defined in NH WQS (Env-Wq 1708.09(a)) as those that use 20% or more of the remaining assimilative capacity for a water quality parameter in terms of either concentration or mass of pollutants or flow rate for water quantity. When NHDES determines that a proposed increase would cause a significant impact to existing water quality, the applicant must provide documentation to demonstrate that the lowering of water quality is necessary, that it will provide net economic or social benefit in the area in which the water body is located, and that the benefits of the activity outweigh the environmental impact caused by the reduction in water quality. *See* Env-Wq 1708.10(b).

This permit is being reissued with effluent limitations sufficiently stringent to satisfy the State's antidegradation requirements, including the protection of the existing uses of the receiving water.

2.2.3 Assessment and Listing of Waters and Total Maximum Daily Loads.

The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. To meet this goal, the CWA requires states to develop information on the quality of their water resources and report this information to EPA, the U.S. Congress, and the public. To this end, EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both § 305(b) and § 303(d) of the CWA. The integrated list format allows states to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories: 1) unimpaired and not threatened for all designated uses; 2) unimpaired waters for some uses and not assessed for others; 3) insufficient information to make assessments for any uses; 4) impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) impaired or threatened for one or more uses and requiring a TMDL.

A TMDL is a planning tool and potential starting point for restoration activities with the ultimate goal of attaining water quality standards. A TMDL essentially provides a pollution budget designed to restore the health of an impaired water body. A TMDL typically identifies the source(s) of the pollutant from point sources and non-point sources, determines the maximum load of the pollutant that the water body can tolerate while still attaining WQSs for the designated uses, and allocates that load among to the various sources, including point source discharges, subject to NPDES permits. *See* 40 CFR § 130.7.

For impaired waters where a TMDL has been developed for a particular pollutant and the TMDL includes a waste load allocation (WLA) for a NPDES permitted discharge, the effluent limitation in the permit must be "consistent with the assumptions and requirements of any available WLA". 40 CFR § 122.44(d)(1)(vii)(B).

2.2.4 Reasonable Potential

Pursuant to CWA § 301(b)(1)(C), 33 U.S.C. § 1311(b)(1)(C), and 40 CFR § 122.44(d)(1), NPDES permits must contain any requirements in addition to TBELs that are necessary to achieve water quality standards established under § 303 of the CWA. In addition, permit limits "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) which the permitting authority determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality." 40 CFR § 122.44(d)(1)(i). To determine if the discharge causes, or has the reasonable potential to cause, or contribute to an excursion above any WQS, EPA considers: 1) existing controls on point and non-point sources of pollution; 2) the variability of the pollutant or pollutant parameter in the effluent; 3) the

sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity); and 4) where appropriate, the dilution of the effluent by the receiving water. *See* 40 CFR § 122.44(d)(1)(ii).

If the permitting authority determines that the discharge of a pollutant will cause, has the reasonable potential to cause, or contribute to an excursion above WQSs, the permit must contain WQBELs for that pollutant. *See* 40 CFR § 122.44(d)(1)(i).

2.2.5 State Certification

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate the State WQSs, or the State waives, or is deemed to have waived, its right to certify. *See* 33 U.S.C. § 1341(a)(1). Regulations governing state certification are set forth in 40 CFR § 124.53 and § 124.55. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects that the Draft Permit will be certified.

If the State believes that conditions more stringent than those contained in the Draft Permit are necessary to meet the requirements of either CWA §§ 208(e), 301, 302, 303, 306 and 307, or applicable requirements of State law, the State should include such conditions in its certification and, in each case, cite the CWA or State law provisions upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. EPA includes properly supported State certification conditions in the NPDES permit. The only exception to this is that the permit conditions/requirements regulating sewage sludge management and implementing CWA § 405(d) are not subject to the State certification requirements. Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through EPA's permit appeal procedures of 40 CFR Part 124.

In addition, the State should provide a statement of the extent to which any condition of the Draft Permit can be made less stringent without violating the requirements of State law. Since the State's certification is provided prior to final permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition.

It should be noted that under CWA § 401, EPA's duty to defer to considerations of State law is intended to prevent EPA from relaxing any requirements, limitations or conditions imposed by State law. Therefore, "[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition." 40 CFR § 124.55(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." *Id.* EPA regulations pertaining to permit limitations based upon WQSs and State requirements are contained in 40 CFR §§ 122.4(d) and 122.44(d).

2.3 Effluent Flow Requirements

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

Generally, EPA uses a discharger's effluent flow volume both to determine whether an NPDES permit needs certain effluent limitations and to calculate the limitations themselves. EPA practice is to use effluent flow as a reasonable and important worst-case condition in its reasonable potential and WQBEL calculations to ensure compliance with WQSs under CWA § 301(b)(1)(C). Should a facility's effluent flow exceed the flow assumed in these calculations, the in-stream dilution would be reduced, and the calculated effluent limitations might not be sufficiently protective (i.e. might not meet WQSs). Further, pollutants that do not have the reasonable potential to exceed WQSs at a lower discharge flow may have a reasonable potential to do so at a higher flow due to the decreased dilution in the receiving water (which, conversely, means there will be a higher concentration of the pollutants). In order to ensure that the assumptions underlying EPA's reasonable potential analyses and permit effluent limitation derivations remain sound for the duration of the permit, EPA may ensure the validity of its "worst-case" effluent flow assumptions through imposition of permit conditions for effluent flow.[1] In this regard, the effluent flow limitation is a component of an WQBELs because the WQBELs are premised on a maximum level flow. The effluent flow limit may also be necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQSs.

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

Setting limits on effluent flow volumes is within EPA's authority to condition a permit to carry out the objectives and satisfy the requirements of the CWA. *See* CWA §§ 402(a)(2) and 301(b)(1)(C); 40 CFR §§ 122.4(a) and (d), 122.43 and 122.44(d). Regulating the quantity of

[1] EPA's regulations regarding "reasonable potential" require EPA to consider "where appropriate, the dilution of the effluent in the receiving water," *id* 40 CFR §122.44(d)(1)(ii). *Both* the effluent flow and receiving water flow may be considered when assessing reasonable potential. *In re Upper Blackstone Water Pollution Abatement Dist.,* 14 E.A.D. 577. 599 (EAB 2010). EPA guidance directs that this "reasonable potential: analysis be based on "worst-case" conditions. *See In re Washington Aquaduct Water Supply Sys.* 11 E.A.D. 565, 584 (EAB 2004).

pollutants in the discharge through a restriction on the quantity of effluent is also consistent with EPA's authorities under the CWA.

As provided in Part II.B.1 (Standard Conditions) of the proposed permit and 40 CFR § 122.41(e), the Permittee is required to properly operate and maintain all facilities and systems of treatment and control. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Consequently, an effluent flow limit is a permit condition that relates to the Permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 CFR §§ 122.41(d), (e).

EPA has also included the effluent flow limit in the permit to minimize or prevent infiltration and inflow (I/I) that may result in unauthorized discharges and compromise proper operation and maintenance of the facility. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes or deteriorated joints. Inflow is extraneous flow added to the collection system that enters the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity available for treatment and the operating efficiency of the treatment works and to properly operate and maintain the treatment works.

Furthermore, the extraneous flow due to significant I/I greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems. Consequently, the effluent flow limit is a permit condition that relates to the permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 CFR §§ 122.41(d), (e).

2.4 Monitoring and Reporting Requirements

2.4.1 Monitoring Requirements

Sections 308(a) and 402(a)(2) of the CWA and the implementing regulations at 40 CFR Parts 122, 124, 125, and 136 authorize EPA to include monitoring and reporting requirements in NPDES permits.

The monitoring requirements included in this permit have been established to yield data representative of the Facility's discharges in accordance with CWA §§ 308(a) and 402(a)(2), and consistent with 40 CFR §§ 122.41(h), (j), and (l)(9), 122.43(a), 122.44(i) and 122.48. The Draft Permit specifies routine sampling and analysis requirements to provide ongoing, representative information on the levels of regulated constituents in the discharges. The monitoring program is needed to enable EPA and the State to assess the characteristics of the Facility's effluent,

whether Facility discharges are complying with permit limits, and whether different permit conditions may be necessary in the future to ensure compliance with technology-based and water quality-based standards under the CWA. EPA and/or the State may use the results of the chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to CWA § 304(a)(1), State water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including, but not limited to, those pollutants listed in Appendix D of 40 CFR Part 122.

NPDES permits require that the approved analytical procedures found in 40 CFR Part 136 be used for sampling and analysis unless other procedures are explicitly specified. *See* 40 CFR § 122.41 (j)(4). Permits also include requirements necessary to comply with the *National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting Rule*.[2] This Rule requires that where EPA-approved methods exist, NPDES applicants must use sufficiently sensitive EPA-approved analytical methods when quantifying the presence of pollutants in a discharge. Further, the permitting authority must prescribe that only sufficiently sensitive EPA-approved methods be used for analyses of pollutants or pollutant parameters under the permit. The NPDES regulations at 40 CFR § 122.21(e)(3) (completeness), 40 CFR § 122.44(i)(1)(iv) (monitoring requirements) and/or as cross referenced at 40 CFR § 136.1(c) (applicability) indicate that an EPA-approved method is sufficiently sensitive where:

- The method minimum level[3] (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or
- In the case of permit applications, the ML is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or parameter in the discharge; or
- The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter.

2.4.2 Reporting Requirements

The Draft Permit requires the Permittee to report monitoring results obtained during each calendar month to EPA and the State electronically using NetDMR. The Permittee must submit

[2] Fed. Reg. 49,001 (Aug 19, 2014).

[3] The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL). Minimum levels may be obtained in several ways: They may be published in a method; they may be sample concentrations equivalent to the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a lab, by a factor. EPA is considering the following terms related to analytical method sensitivity to be synonymous: "quantitation limit," "reporting limit," "level of quantitation," and "minimum level." *See* Fed. Reg. 49,001 (Aug. 19, 2014).

a Discharge Monitoring Report (DMR) for each calendar month no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool enabling regulated CWA permittees to submit DMRs electronically via a secure internet application to EPA through the Environmental Information Exchange Network. NetDMR has eliminated the need for participants to mail in paper forms to EPA under 40 CFR §§ 122.41 and 403.12. NetDMR is accessible through EPA's Central Data Exchange at https://cdx.epa.gov/. Further information about NetDMR can be found on EPA's NetDMR support portal webpage.[4]

With the use of NetDMR, the Permittee is no longer required to submit hard copies of DMRs and reports to EPA and the State unless otherwise specified in the Final Permit. In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR. Certain exceptions are provided in the permit, such as for providing written notifications required under the Part II Standard Conditions.

2.5 Standard Conditions

The Standard Conditions, included as Part II of the Draft Permit, are based on applicable regulations found in the EPA's NPDES permitting regulations. *See* 40 CFR Part 122.41 *See also, generally,* 40 CFR Part 122.

2.6 Anti-backsliding

The CWA's anti-backsliding requirements prohibit a permit from being renewed, reissued or modified to include with less stringent limitations or conditions than those contained in a previous permit except in compliance with one of the specified exceptions to those requirements. *See* CWA §§ 402(o) and 303(d)(4) and 40 CFR § 122.44(l). Anti-backsliding provisions apply to effluent limits based on technology, water quality and/or state certification requirements.

All proposed limitations in the Draft Permit are at least as stringent as limitations included in the 2015 Permit unless specific conditions exist to justify relaxation in accordance with CWA § 402(o) or § 303(d)(4). Discussion of any less stringent limitations and corresponding exceptions to anti-backsliding provisions is provided in the sections that follow.

[4] https://netdmr.zendesk.com/hc/en-us/articles/209616266-EPA-Region-1-NetDMR-Information

3.0 Description of Facility and Discharge

3.1 Location and Type of Facility

The location of the treatment plant and Outfall 001 to Merrimack River are shown in Figure 1. The longitude and latitude of Outfall 001 are 42° 56' 22" N, 71° 27' 25" W.

This facility is engaged in the collection and treatment of domestic, commercial and industrial wastewaters from the City of Manchester (109,000 served) and three surrounding towns. The City's wastewater treatment facility (WWTF) is a 34 mgd conventional activated sludge facility.

EPA is including three co-permittees to the Draft Permit. The Towns of Londonderry (23,000 served), Bedford (6,000 served), and Goffstown (17,000 served) own and operate sanitary wastewater collection systems that discharge flows to the Manchester WWTF for treatment. These municipalities are co-permittees for certain activities pertaining to proper operation and maintenance of their respective collection systems (*See* Part I.C. and I.D of the Draft Permit). Adding them to the Draft Permit ensures that they comply with requirements to operate and maintain the collection systems so as to avoid discharges of sewage from the collection systems. These co-permittees did not apply for permit coverage; with letters sent February 6, 2024, EPA waived application requirements for the co-permittees. The legal basis for including municipal satellite collection systems as co-permittees is described in *In re Charles River Pollution Control District*, 16 E.A.D. 623 (EAB 2015)[5].

According to the City's NPDES Application, there are 18 significant industrial users (including 6 categorical industrial users) discharging to the City's collection system. The total process wastewater flow from industries in Manchester is approximately 1 million gallons per day (mgd) and the wastewater flow from industries in the towns of co-permittees are an additional 1 mgd, comprising a total of approximately 2 mgd or 10 percent of the total average monthly flow to the treatment plant. Septage (sludge pumped from septic tanks and brought to the treatment plant by septage haulers) accounts for less than 0.1 percent of the total average treatment plant flow.

A quantitative description of the discharge in terms of effluent parameters, based on monitoring data submitted by the permittee from December 2018 through November 2023 is provided in Appendix A of this Fact Sheet.

3.1.1 Treatment Process Description

The Manchester WWTF provides preliminary, primary, and secondary treatment of municipal wastewater. The first process is preliminary treatment. This step consists of screening which

[5] The decision is available at: https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Published%20and%20Unpublished%20Decisions/F89699D1A0710BCF85257DE200717A93/$File/Charles%20River%20Decision%20Vol%2016.pdf

removes rags, sticks, and other large items from the wastewater stream by means of a bar rack. The next step is grit removal, as the wastewater enters the chamber the flow decreases to a rate of 2 feet per second (fps) which causes sand and other inorganic materials to settle out of the stream. The air from the grit blowers keeps organic materials, such as food wastes and human waste, in suspension where it progresses to the next treatment process: primary treatment. The grit is pumped out of the chamber then is removed by a mechanical classifier and disposed of in a landfill.

Primary treatment occurs in three circular 125 foot primary clarifiers. The wastewater from the grit chamber enters the primary clarifiers where it has a residence time of approximately 2 hours. During this process, solid materials settle due to gravity. The settled solids are collected by sweeping mechanisms at the bottom of the tanks where they are pumped to the gravity thickeners, which are part of the sludge handling process. Approximately 50 to 60% of the suspended solids are removed during primary clarification. From here, the wastewater begins the secondary treatment phase.

During secondary treatment, two processes occur. The first process is the activated sludge process. This occurs within aeration tanks where bacteria are grown and cultured. The bacteria use oxygen and feed on the remaining suspended solids and dissolved organic matter. Air is introduced to the aeration tanks to assure sufficient oxygen is available to allow the bacteria to survive. From here the wastewater enters the secondary clarifiers. Like the primary clarifiers, there are three circular 125 foot secondary clarifiers. The secondary clarification process allows the bacteria from the aeration basins to settle out via gravity. The solids from the secondary clarifiers are either returned to the aeration basin and/or transferred to the thickening centrifuges. At this point the wastewater is disinfected prior to discharge. During the disinfection process, the wastewater is chlorinated and dechlorinated.

Sodium hypochlorite is added to the wastewater and travels in a maze-like pattern in the chlorine contact chamber to allow for a minimum of one-hour contact time between the chlorine and the wastewater. Because chlorine can be harmful to aquatic life, the wastewater is dechlorinated prior to final discharge. Sodium bisulfite is added to the wastewater and a minimum of two-minutes contact is necessary to allow the chlorine to be neutralized into harmless salts. At this point the water becomes plant effluent and is discharged to the Merrimack River.

In September 2000, the City completed construction of a bypass of its existing secondary treatment works. This bypass allows the treatment plant to accept wet weather flows up to 70 MGD into the treatment plant, with flows up to 34 MGD receiving full secondary treatment and flows between 34 and 70 MGD receiving primary treatment (*i.e.*, primary clarification and removal of solids and floatables) and disinfection (Note that disinfection occurs in chlorine contact tanks after the bypassed flow is blended with the flow receiving secondary treatment).

This increase in wet weather flow capacity reduces the magnitude and frequency of untreated wastewater discharges through CSOs. The addition of this bypass was part of Phase 1 of the Long-Term Control Plan discussed in Section 5.6 of this Fact Sheet.

The biosolids collected in the primary and secondary clarifiers are transferred to the sludge handling process, which consists of thickening, dewatering, and eventual incineration in the Fluidized Bed Incinerator (FBI). The primary sludge is thickened in the gravity thickeners. The gravity thickeners consist of three tanks 50 feet in diameter. By means of gravity, further solid/liquid separation occurs to a point where the solids content in the thickeners is approximately 4% to 6% solids.

The waste activated sludge is sent to one of three thickening centrifuges. The sludge is thickened to approximately 3% to 4% solids. The thickened waste activated sludge and the thickened primary sludge are pumped to an inline mixer where they are blended. The blended thickened sludge is then pumped to one of three dewatering centrifuges for dewatering. A screw mechanism within the center of the spinning centrifuge moves the sludge as solids are separated from liquid. The sludge has a solids content of approximately 24% to 26% when it exits the centrifuge. At this point the sludge is sufficiently dewatered and it is sent to a Sludge Silo for storage. The stored dewatered sludge is then sent to the FBI for incineration once the level in the silo is 75% of its capacity. During occasional maintenance activities when the incinerator is not in operation, the sludge is then sent to sludge trailers for off-site disposal. In 2023, the facility generated 4,424 dry metric tons of biosolids.

3.1.2 Collection System Description

The City of Manchester owns and operates a wastewater collection system comprised of 55 percent sanitary sewers, which carry domestic, industrial, and commercial wastewater; and 45 percent combined sewers, which carry domestic, industrial, and commercial wastewater plus stormwater runoff. Manchester's wastewater collection system consists of ten pumping stations and approximately 385 miles of sewers. The WWTF serves the majority of Manchester along with portions of Bedford, Goffstown and Londonderry. The Goffstown, Bedford and Londonderry have separate sewer systems. There are 15 CSO outfalls remaining in the Manchester wastewater collection system and interceptor network. Of the 15 remaining CSO outfalls, 2 discharge to the Piscataquog River (adjacent to Bass Island and immediately upstream of the river's confluence with the Merrimack River), 2 discharge to the Merrimack River from the west side of the city, and 11 discharge to the Merrimack River from the east side of the city (including Tannery Brook and Ray Brook). During certain wet weather events, discharges of untreated sanitary wastewater and stormwater occur from the City's 15 combined sewer overflow outfalls ("CSOs") into the Piscataquog and Merrimack Rivers, as listed below and shown in Appendix C.

4.0 Description of Receiving Water and Dilution

4.1 Receiving Water

The Manchester WWTF discharges through Outfall 001 into the Merrimack River, to AUID NHRIV700060803-14-02. The Merrimack River flows to the Plum Island Estuary in Newburyport, Massachusetts.

The Merrimack River is classified as a Class B water by the State of New Hampshire. According to New Hampshire's WQS (RSA 485-A:8), "*Class B waters shall be of the second highest quality and shall have no objectionable physical characteristics, shall contain a dissolved oxygen content of at least 75 percent of saturation, and shall contain not more than either a geometric mean based on at least 3 samples obtained over a 60-day period of 126 Escherichia coli per 100 milliliters, or greater than 406 Escherichia coli per 100 milliliters in any one sample; and for designated beach areas shall contain not more than a geometric mean based on at least 3 samples obtained over a 60-day period of 47 Escherichia coli per 100 milliliters, or 88 Escherichia coli per 100 milliliters in any one sample; unless naturally occurring. There shall be no disposal of sewage or waste into said waters except those which have received adequate treatment to prevent the lowering of the biological, physical, chemical or bacteriological characteristics below those given above, nor shall such disposal of sewage or waste be inimical to aquatic life or to the maintenance of aquatic life in said receiving waters. The pH range for said waters shall be 6.5 to 8.0 except when due to natural causes. Any stream temperature increase associated with the discharge of treated sewage, waste or cooling water, water diversions, or releases shall not be such as to appreciably interfere with the uses assigned to this class.*"

The Merrimack River AUID NHRIV700060803-14-02 is listed in the final *New Hampshire Integrated List of Waters for the Clean Water Act 2020-2022 Reporting Cycle* ("303(d) List") as a Category 5 "Waters Requiring a TMDL.[6] The pollutants requiring TMDLs are aluminum and pH. In 2011, NHDES finalized a bacteria TMDL for segment NHRIV700060802-15, among other water body segments.

The 15 CSO outfalls discharge to seven receiving water segments. The impairments, if any, of each receiving water segment are presented in Table 1.

Table 1: Receiving Water Impairments

Outfall	Assessment Unit Name	Assessment Unit ID	Impaired Designated Use	Parameter Name
001, 011, 018, 044, 045, 046, 051, 052, 055,	Merrimack River	NHRIV700060803-14-02	Aquatic Life	Aluminum, pH, Phosphorus
			Primary Contact Recreation	E. coli
			Fish Consumption	Mercury
047, 053	Merrimack River – Amoskeg Dam Bypass	NHRIV700060803-14-01	Fish consumption	Mercury
031	Merrimack River – Amoskeag Dam	NHIMP700060802-04	Primary and Secondary Contact Recreation	E. coli
			Fish Consumption	Mercury
039	Piscataquog River	NHRIV700060607-22	Aquatic Life	pH
			Primary and Secondary Contact Recreation	E. coli
			Fish Consumption	Mercury
054	Rays Brook	NHRIV700060802-15	Aquatic Life	Chloride
			Fish Consumption	Mercury
043	Baker Brook	NHRIV700060803-08	Aquatic Life	Chloride
			Fish Consumption	Mercury
050	Unnamed Brook	NHRIV700060803-17	Fish consumption	Mercury

4.2 Ambient Data

A summary of the ambient data collected in the receiving water in the vicinity of the outfall that is referenced in this Fact Sheet can be found in Appendix A of this Fact Sheet.

4.3 Available Dilution

To ensure that discharges do not cause or contribute to violations of WQS under all expected conditions, WQBELs are derived assuming critical conditions for the receiving water[7]. The critical flow in rivers and streams is some measure of the low flow of that river or stream. State WQSs at Env-Wq 1705.2 require that:

[7] EPA Permit Writer's Manual, Section 6.2.4

(a) The flow used to calculate permit limits shall be specified in (b) through (d), below.

(b) For tidal waters, the flow condition shall be equivalent to the conditions that result in a dilution that is exceeded 99% of the time.

(c) For non-tidal rivers and streams, permit limits for all human health criteria for carcinogens shall be developed based on the long-term harmonic mean flow, which is the number of daily flow measurements divided by the sum of the reciprocals of the daily flows.

(d) For non-tidal rivers and streams, permit limits for all aquatic life criteria and human health criteria for non-carcinogens shall be based on the 7Q10 flow.

NHDES calculated the 7Q10 as follows:

7Q10 Streamflow Analysis

The Manchester Wastewater Treatment Plant (WWTP) outfall is located just downstream of the USGS Merrimack River Near Goffs Falls, Below Manchester, NH Gage (01092000). Therefore, the 7Q10 at a location just upstream of the Manchester WWTP outfall was calculated using the gage data, and the Dingman ratio proration method[8] was not used. The calculated 7Q10 is 676 cfs.

Dilution Factor Calculation

The dilution factor for the Manchester WWTP outfall was calculated using the following equation:

Dilution Factor = $0.9 * (Q_S+Q_D)/Q_D$

Where: Q_S = 7Q10 flow of the Merrimack River just upstream of outfall = 676 cfs
Q_D = design flow of Manchester WWTP = 34 mgd = 52.6 cfs
0.9 = factor to reserve 10% of the receiving water assimilative capacity

Dilution Factor = 0.9*(676+52.6) / 52.6 = **12.5**

5.0 Proposed Effluent Limitations and Conditions

The proposed effluent limitations and conditions derived under the CWA and State WQSs are described below. These proposed effluent limitations and conditions, the basis of which are discussed throughout this Fact Sheet, may be found in Part I of the Draft Permit.

[8] Dingman, S.L., and S.C Lawlor, 1995. Estimating Low-Flow Quantiles from Drainage-Basin Characteristics in New Hampshire and Vermont, American Water Resources Association, Water Resources Bulletin, pp 243-256.

5.1 Effluent Limitations and Monitoring Requirements

In addition to the State and Federal regulations described in Section 2, data submitted by the permittee in its permit application, in monthly discharge monitoring reports (DMRs) and in WET test reports from December 2018 to November 2023 (the "review period") were used to identify the pollutants of concern and to evaluate the discharge during the effluent limitations development process (*See* **Appendix A)**.The reasonable potential analysis is included in Appendix B and results are discussed in the sections below.

5.1.1 Effluent Flow

The effluent flow in the 2015 Permit is a reporting requirement only. The DMR data during the review period show that the average monthly flow ranged from 12.37 MGD to 31.17 MGD.

The flow effluent limit reflects the design flow of the facility of 34 MGD.

The Draft Permit includes an average monthly flow limit of 34 MGD, reported as a rolling annual average. The Draft Permit requires that flow be measured continuously and that the rolling annual average flow, as well as the average monthly and maximum daily flow for each month be reported. The rolling annual average flow is calculated as the average of the flow for the reporting month and 11 previous months.

As noted in Section 3.1.1 above, the facility is able to bypass secondary treatment during period of high flow above 34 MGD. The permit requires that bypasses shall not occur below influent flows of 34 MGD. When bypass occurs, the blended effluent shall be subject to the end-of-pipe effluent limitations in Part I.A.1.a above and all bypasses shall be reported by the Permittee to EPA and NHDES pursuant to Part I.I.6 below. A bypass of secondary treatment is subject to the requirements of Part II.B.4. and Part II.D.1.e. of the permit. The following information shall be reported as an electronic attachment to each March DMR summarizing each day there was a bypass of secondary treatment for the previous calendar year: date and time of initiation of bypass flow, influent flow at time of initiation (MGD), date and time of termination of bypass flow, influent flow at time of termination (MGD), duration of bypass (hrs), and total volume of bypass flow (MG). This information may be used by EPA to evaluate the frequency and magnitude of bypasses of secondary treatment during the permit term.

5.1.2 Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)

5.1.2.1 $CBOD_5$ Concentration Limits

The five-day carbonaceous biochemical oxygen demand ($CBOD_5$) limits in the 2015 Permit were based on the secondary treatment regulations for POTWs found at 40 CFR § 133.102(a) and (b). The average monthly limit is 25 mg/L and the average weekly limit is 40 mg/L. The 2015 Permit also contains a maximum daily limitation of 45 mg/L for $CBOD_5$.

The DMR data during the review period shows that there have been no violations of the $CBOD_5$ average monthly and average weekly concentration limits, and there has been one violation of the maximum daily limitation for $CBOD_5$.

The Draft Permit proposes the same $CBOD_5$ concentration limits as in the 2015 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency is twice per week.

5.1.2.2 $CBOD_5$ Mass Limits

The mass-based $CBOD_5$ limits in the 2015 Permit are based on the concentration limits noted above and calculated with the facility's design flow of 34 MGD. These are a monthly average of 7,090 lb/day, a weekly average of 11,350 lb/day, and a daily maximum of 12,770 lb/day

The DMR data from the review period shows that there have no exceedances of the average monthly or average weekly $CBOD_5$ mass limits, and that there has been one exceedance of the maximum daily limit.

These mass-based BOD_5 limits were calculated based on the design flow of the facility and the concentration limits shown above, as shown below.

$CBOD_5$ Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly and average weekly $CBOD_5$ are based on the following equation:

$$L = C_d * Q_d * 8.345$$

Where:

L = Maximum allowable load in lb/day
C_d = Maximum allowable effluent concentration for reporting period in mg/L (reporting periods are average monthly and average weekly)
Q_d = Annual average design flow of Facility
8.34 = Factor to convert effluent concentration in mg/L and design flow in MGD to lb/day

Average Monthly: 25 mg/L * 34 MGD * 8.345 = 7,090 lb/day
Average Weekly: 40 mg/L* 34 MGD * 8.345 = 11,350 lb/day
Maximum Daily: 45 mg/L* 34 MGD * 8.345 = 12,770 lb/day

These mass-based $CBOD_5$ limits will be carried forward in the Draft Permit.

5.1.3 Total Suspended Solids (TSS)

5.1.3.1 TSS Concentration Limits

The five-day TSS limits in the 2015 Permit were based on the secondary treatment regulations for POTWs found at 40 CFR § 133.102(a) and (b). The average monthly limit is 30 mg/L and the average weekly limit is 45 mg/L. The 2015 Permit also contains a maximum daily limitation of 50 mg/L for TSS.

The DMR data during the review period shows that there have been no violations of the TSS average monthly and average weekly concentration limits, and there has been two violations of the maximum daily limitation.

The Draft Permit proposes the same TSS concentration limits as in the 2015 Permit as no new WLAs have been established and there have been no changes to the secondary treatment standards. The monitoring frequency shall be twice per week.

5.1.3.2 TSS Mass Limits

The mass-based TSS limits in the 2015 Permit are based on the concentration limits noted above and calculated with the facility's design flow of 34 MGD. These are a monthly average of 8,510 lb/day, a weekly average of 12,770 lb/day, and a daily maximum of 14,190 lb/day.

The DMR data from the review period shows that there have no exceedances of the average monthly or average weekly TSS mass limits, and there have been four exceedances of the maximum daily limit.

These mass-based TSS limits were calculated based on the design flow of the facility and the concentration limits above, as shown below.

TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly and average weekly TSS are based on the following equation:

$$L = C_d * Q_d * 8.345$$

Where:

L = Maximum allowable load in lb/day
C_d = Maximum allowable effluent concentration for reporting period in mg/L (reporting periods are average monthly and average weekly)
Q_d = Annual average design flow of Facility

Average Monthly: 30 mg/L * 34 MGD * 8.345 = 8,510 lb/day
Average Weekly: 45 mg/L* 34 MGD * 8.345 = 12,770 lb/day

Maximum Daily: 50 mg/L * 34 MGD * 8.345 = 14,190 lb/day

These mass-based TSS limits will be carried forward in the Draft Permit.

5.1.4 Eighty-Five Percent (85%) BOD_5 and TSS Removal Requirement

In accordance with the provisions of 40 CFR § 133.102(a)(4) and (b)(3), the 0001 Permit requires that the 30-day average percent removal for BOD_5 and TSS be not less than 85%. The DMR data during the review period shows that the median BOD_5 and TSS removal percentages are 98% and 98%, respectively. There were no exceedances of the 85% removal requirement for BOD_5 or TSS during that period.

The requirement to achieve 85% BOD_5 and TSS removal has been carried forward into the Draft Permit and will continue to apply only during dry weather.

5.1.5 pH

Consistent with the requirements of New Hampshire's WQS at RSA 485-A:8 II, "The pH for said (Class B) waters shall be 6.5 to 8.0 except when due to natural causes." The monitoring frequency is once per day. The DMR data during the review period show that there have been no exceedances of the pH limitations.

The pH requirements in the 2015 Permit are carried forward into the Draft Permit as there has been no change in the WQSs with regards to pH. The limitations are based on CWA 301(b)(1)(C) and 40 CFR § 122.44(d).

5.1.6 Bacteria

The 2015 Permit includes effluent limits for bacteria using *Escherichia coli* (*E. coli*) bacteria as the indicator bacteria to protect recreational uses. NH WQS at Env-Wq 1700, Appendix E require a monthly geometric mean of 126 *E. coli*/100 ml and a maximum daily limit of 406 *E. coli*/100 ml. The DMR data during the review period show that there have been no exceedances of the *E. coli* limitations.

The Draft Permit proposes maintaining the effluent limits for bacteria from the 2015 Permit. EPA has revised the units to reflect those in the NH WQS. The *E. coli* limits are a monthly geometric mean of 126 *E. coli*/100 ml and a maximum daily limit of 406 *E. coli*/100 ml. The sampling frequency for *E. coli* is three per week.

5.1.7 Total Residual Chlorine

The Permittee uses chlorine disinfection. The 2015 Permit includes effluent limitations for total residual chlorine (TRC) of 130 µg/L (average monthly) and 220 µg/L (maximum daily). The DMR

data during the review period show that there have been no exceedances of the TRC limitations.

The TRC permit limits are based on the instream chlorine criteria defined the New Hampshire Code of Administrative Rules, Env-Wq 1703.21 and Table 1703.1. These freshwater instream criteria for chlorine are 11 µg/L (chronic) and 19 µg/L (acute). Because the upstream chlorine is assumed to be zero in this case, the water quality-based chlorine limits are calculated as the criteria times the dilution factor, as follows:

Chronic criteria * dilution factor = Chronic limit
11 µg/L * 12.5 = 137.5 µg/L (average monthly)

Acute criteria * dilution factor = Acute limit
19 µg/L * 12.5 = 237.5 µg/L (maximum daily)

These limits are less stringent than those in the 2015 Permit. Therefore, to be consistent with the anti-backsliding requirements discussed in Section 2.6, the limits in the 2015 Permit are carried forward into the Draft Permit.

5.1.8 Ammonia

The 2015 Permit does not include ammonia limits, but the Permittee was required to monitor and report effluent and ambient ammonia concentrations on a quarterly basis as part of the Whole Effluent Toxicity (WET) testing. Additionally, at EPA's request Manchester provided effluent ammonia data via email on February 13, 2024, that they had collected from 2019 through 2023 outside of WET testing. All monthly average ammonia data are summarized Table 2 below and have been incorporated into the reasonable potential analysis for ammonia (*See* Appendix B).

Table 2: Effluent Monthly Average Ammonia Data (mg/L)

Month	2019	2020	2021	2022	2023
January	---	---	13.00	15.00	9.40
February	12.00	15.00	17.50	11.00	13.00
March	---	---	16.00	12.00	12.00
April	13.00	---	14.00	11.50	9.90
May	---	11.50	18.00	16.00	14.00
June	---	17.00	16.00	14.00	12.50
July	---	12.1	5.30	8.6	9.00
August	---	3.6	11.00	6.20	6.40
September	15.00	19.0	6.80	3.7	4.00
October	8.70	8.25	4.90	15.00	7.30
November	---	11.00	11.00	9.10	12.00
December	---	12.00	5.70	13.00	8.20

Ambient data, taken upstream of the Manchester outfall in the Merrimack River, is presented in Appendix A and shows the median concentration for the warm weather period (May 1 through October 31) is 0.17 mg/L and for the cold weather period (November 1 through April 30) is 0.12 mg/L.

The freshwater ammonia criteria in the NH WQS (Env-Wq 1703.25 & 1703.26) are dependent on pH and temperature and the acute criterion is also dependent on whether Salmonids are present in the receiving water.

In determining whether the discharge has the reasonable potential to cause or contribute to excursions above the instream water quality criteria for ammonia, EPA used the mass balance equation presented in Appendix B for both warm and cold weather conditions to project the ammonia concentration downstream of the discharge. If there is reasonable potential, this mass balance equation is also used to determine the limit that is required in the permit.

To determine the applicable ammonia criteria, EPA assumes a warm weather (May through October) temperature of 25° C and a cold weather (November through April) temperature of 5° C. EPA used the ambient pH monitoring shown in Appendix A, which indicates that the median pH is 7.5 S.U. Additionally, the Merrimack River in the vicinity of the Manchester WWTF discharge is within Essential Fish Habitat (EFH) for Atlantic salmon (*Salmo salar*), so EPA has assumed that salmonids could be present in the receiving waters.

Based on the information and assumptions described above, Appendix B presents the applicable ammonia criteria, the details of the mass balance equation, the reasonable potential determination, and, if necessary, the limits required in the Draft Permit. As shown, EPA determined that there is reasonable potential to cause or contribute to an excursion of WQS for ammonia, so the Draft Permit proposes a new monthly average ammonia limit of 10.4 mg/L from May through October.

DMR data during the review period indicate that the facility has not been consistently below the proposed average monthly limit. As shown in Attachment A, the maximum average monthly discharge in the warm season was 19 mg/L (in September 2020) compared to the proposed limit of 10.4 mg/L. Therefore, the Draft Permit includes a two-year compliance schedule to allow for optimization of the treatment processes to meet the proposed limit.

5.1.9 Nutrients

Nutrients are compounds containing nitrogen and phosphorus. Although nitrogen and phosphorus are essential for plant growth, high concentrations of these nutrients can cause eutrophication, a condition in which aquatic plant and algal growth is excessive. Plant and algae respiration and decomposition reduces dissolved oxygen in the water, creating poor habitat for fish and other aquatic animals. Recent studies provide evidence that both phosphorus and nitrogen can play a role in the eutrophication of certain ecosystems. However, typically

phosphorus is the limiting nutrient triggering eutrophication in freshwater ecosystems and nitrogen in marine or estuarine ecosystems. Thus, for this receiving water phosphorus and nitrogen are the nutrients of concern evaluated below.

5.1.9.1 Total Nitrogen

The Merrimack River is a large and densely populated watershed including 40 POTW discharges in Massachusetts and New Hampshire. EPA estimates that approximately 15,000 lb/day of nitrogen is discharged by POTWs into the freshwater portion of the watershed and another 2,000 lb/day into the marine portion. Recent nitrogen data collected by CDM Smith in 2014 and 2016 in the estuarine portions of the Merrimack River indicates elevated total nitrogen and chlorophyll 'a' levels. High nutrient concentrations can lead to increased levels of chlorophyll 'a', therefore chlorophyll 'a' can be an indicator of elevated nutrient concentrations. In samples with salinity greater than 10 ppt, total nitrogen ranged from 0.442 to 1.67 mg/L while chlorophyll 'a' ranged from 4 to 42 ppt[9] . EPA also collected samples on the outgoing tide in 2017 in this area and found total nitrogen levels in the range of 0.62 mg/L to 1.3 mg/L and chlorophyll 'a' ranging from 2 to 11 ppt in samples with salinity greater than 10 ppt. EPA continued to collect ambient samples in 2018 and 2019 which demonstrated similar results. EPA is concerned about the impacts that these nitrogen levels may be having on aquatic life in the estuary as most of these results are outside the range typically found in healthy estuaries in Massachusetts[10]. However, more data is necessary to determine whether there is reasonable potential for nitrogen discharges from the facility to cause or contribute to a violation of the narrative nutrient criteria in the Merrimack River estuary, particularly data that characterizes aquatic life designated uses that may be affected in this area so that the narrative criteria can be interpreted numerically. In the meantime, EPA finds that quantifying the load of total nitrogen from this facility and others in the Merrimack River watershed is an important first step to understanding the nitrogen load from point sources and their potential impact on the estuary.

The Draft Permit includes weekly monitoring and reporting requirements for total nitrate plus total nitrite, total Kjeldahl nitrogen (TKN) and total nitrogen from April through October and monthly monitoring and reporting from November through March. The monitoring data will provide additional information on the fate of nitrogen through the treatment process and the impact to the Merrimack River in the estuary at the mouth of the river.

5.1.9.2 Total Phosphorus

While phosphorus is an essential nutrient for the growth of aquatic plants, it can stimulate rapid plant growth in freshwater ecosystems when it is present in high quantities.

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[9] CDM Smith/US Army Corps of Engineers New England District, Merrimack River Watershed Assessment Study - Phase III Final Monitoring Data Report August 2017, Appendix C.

[10] Howes, Brian, et al, Site-Specific Nitrogen Thresholds for Southeastern Massachusetts Embayments: Critical Indicators Interim Report, Massachusetts Estuaries Project, December 22, 2003.

The excessive growth of aquatic plants and algae within freshwater systems negatively impacts water quality and can interfere with the attainment of designated uses by: 1) increasing oxygen demand within the water body to support an increase in both plant respiration and the biological breakdown of dead organic (plant) matter;[11] 2) causing an unpleasant appearance and odor; 3) interfering with navigation and recreation, for instance, by fouling engines and propellers, making waters unappealing to swimmers, and interfering with fishing lures and equipment; 4) reducing water clarity; 5) reducing the quality and availability of suitable habitat for aquatic life; and 6) producing toxic cyanobacteria during certain algal blooms. Cultural (or accelerated) eutrophication is the term used to describe dense and excessive plant growth in a water body that results from nutrients entering the system as a result of human activities. Discharges from municipal and industrial wastewater treatment plants, agriculture runoff, and stormwater are examples of human-derived (*i.e.*, anthropogenic) sources of nutrients in surface waters. See generally, *Nutrient Criteria Technical Guidance Manual – Rivers and Streams*, EPA July 2000 [EPA-822-B-00-002], Chapters 1 and 3.

The New Hampshire Surface Water Quality Regulations contain a narrative criterion that limits phosphorus to the level that will not impair a water body's designated use. Specifically, Env-Wq 1703.14(b) states that, "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring." Env-Wq 1703.14(c), further states that, "Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards." Cultural eutrophication is defined in Env-Wq 1702.15 as, "… the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen." Cultural eutrophication also results in violations of other nutrient-related water quality standards such as low dissolved oxygen, decreased water clarity, objectionable odors and surface scum. The NH WQS at Env-Wq 1703.07(b)(2) require that dissolved oxygen have an instantaneous minimum concentration of at least 5 mg/L in Class B waters. Further, NH WQS at Env-Wq 1703.12(b) states that Class B waters "shall contain no slicks, odors, or surface floating solids that would impair any existing or designated use, unless naturally occurring." Also see Part 2.2.2 of this Fact Sheet above regarding antidegradation and existing uses which may be impacted by nutrient over-enrichment.

When permitting nutrient discharges, EPA analyzes available information from a reasonably conservative standpoint, as it regards one key function of a nutrient limit as preventative. This protective approach is appropriate because, once begun, the cycle of eutrophication can be difficult to reverse due to the tendency of nutrients to be retained in the sediments. For this

[11] "Algae" includes phytoplankton (microscopic algae measured by levels of chlorophyll a), macroalgae (commonly referred to as seaweed), and other plants stimulated by nutrient over-enrichment. Excessive algal growth contributes to low levels of dissolved oxygen through increased plant respiration and decomposition of dead plant matter. Notably, during the day, algae provide oxygen to the water as a by-product of photosynthesis. At night, however, when photosynthesis ceases but plant respiration continues, dissolved oxygen levels decline. Additionally, as these algae die, they are decomposed by bacteria that consume yet more oxygen. When dissolved oxygen levels are low, aquatic organisms become stressed and die, and overall aquatic health is degraded.

reason, time is of the essence when permitting for nutrients, so EPA acts on the best information reasonably available when developing the draft permit and does not generally delay permit issuance pending collection of new data or development of new models. This approach is also consistent with the requirement for NPDES permits to be revisited and reissued at regular intervals, with permit terms not to exceed five years.

When translating narrative phosphorus criteria into numeric values (and establishing WQBELs, if necessary), EPA looks to a wide range of materials, including nationally recommended criteria and other relevant materials, such as EPA nutrient technical guidance and information published under Section 304(a) of the CWA, peer-reviewed scientific literature and site-specific surveys and data to determine instream targets that are protective of water quality. See 40 CFR § 122.44(d)(1)(vi)(A), (B).

EPA has produced several guidance documents, described below, that recommend a range of total ambient phosphorus concentrations that are sufficiently stringent to control cultural eutrophication and other adverse nutrient-related impacts, with 0.1 mg/L representing the upper end of this range. These guidance documents recommend protective in-stream phosphorus concentrations based on two different analytical approaches. An effects-based approach provides a threshold value above which adverse effects (*i.e.*, water quality impairments) are likely to occur. This approach applies empirical observations of a causal variable (*i.e.*, phosphorus) and a response variable (*i.e.*, chlorophyll-a as a measure of algal biomass) associated with designated use impairments. Alternatively, reference-based values are statistically derived from a comparison within a population of rivers in the same ecoregion class. They are a quantitative set of river characteristics (physical, chemical and biological) that represent conditions in waters in that ecoregion that are minimally impacted by human activities (*i.e.*, reference conditions), and thus by definition representative of water without cultural eutrophication. Dischargers in Massachusetts and New Hampshire are located within either Ecoregion VIII, Nutrient-Poor, Largely Glaciated Upper Midwest and Northeast or Ecoregion XIV, Eastern Coastal Plains. The recommended total phosphorus criteria for these ecoregions are 10 µg/L and 31.25 µg/L, respectively. While reference conditions reflect in-stream phosphorus concentrations that are sufficiently low to meet the requirements necessary to support designated uses, they may also represent levels of water quality beyond what is necessary to support such uses.

EPA follows an effects-based approach. EPA's 1986 *Quality Criteria for Water* (the "Gold Book") recommends maximum threshold concentrations that are designed to prevent or control adverse nutrient-related impacts from occurring. Specifically, the Gold Book recommends in-stream phosphorus concentrations of no greater than 0.1 mg/L for any stream not discharging directly to lakes or impoundments 0.05 mg/L in any stream entering a lake or reservoir, and 0.025 mg/L within a lake or reservoir. In this case, EPA is applying a target concentration of 0.1 mg/L because the receiving water is a stream/river not discharging directly to a lake or impoundment.

As the Gold Book notes, there are natural conditions of a water body that can result in either increased or reduced eutrophic response to phosphorus inputs; in some waters more stringent phosphorus reductions may be needed, while in some others a higher total phosphorus threshold could be assimilated without inducing a eutrophic response. In this case, EPA is not aware of any site-specific factors relevant to the receiving water that would result in it being unusually more or less susceptible to phosphorus loading.

EPA notes that since the 2015 Permit already contained a limit for phosphorus, EPA uses the mass balance equation presented in Appendix B to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (C_d) allowable to meet WQS based on current conditions.

Sampling data from 2014-2016[12], summarized in Table 3, reported three summer in-stream phosphorus concentrations collected at Station 14A-MER located approximately 5.2 miles upstream of the Manchester WWTP.

Table 3: Instream total phosphorus concentrations (mg/L)

Date	14-MER
6/25/2014	0.027
10/1/2015	0.097
8/1/2016	0.023

Based on the phosphorus criterion described above, the ambient data presented above, the upstream 7Q10 flow, and the design flow of the Facility, Appendix B presents the details of the mass balance equation, the determination of whether the existing limit needs to be more stringent to continue to protect WQS.

The 2015 Permit had a limit of 236 lb/day and EPA determined that this limit should be carried forward (applicable from April 1 through October 31) to continue to protect WQS as specified below.

Mass-based limit analysis and comparison

To ensure the revised mass-based limit is protective under the worst-case conditions, the limit is calculated using the lowest expected receiving water flow and effluent flow. Hence, the upstream 7Q10 receiving water flow (676 cfs or 436.7 MGD) and the lowest monthly average effluent flow during the review period (12.4 MGD, See Appendix A) are used. The numeric mass-based limit is determined based on the following equations:

$$Q_E C_E + Q_s C_s = Q_D C_D \times (0.90)$$

[12] Reardon, Matthew, MassDEP, Division of Watershed Management, 2013, "Technical Memorandum: Big River Watershed 2008 DWM Water Quality Monitoring Data," DWM Control Number CN 323.1.

and

$$M_E = Q_E C_E \times 8.345$$

Substituting ($Q_D C_D$) with (M_E/8.345) in the first equation and solving for M_E results in:

$$M_E = (Q_D C_D \times (0.90) - Q_S C_S) \times 8.345$$

where:

M_E = mass-based phosphorus limit
Q_E = effluent flow in MGD (lowest monthly average effluent flow = 12.4 MGD)
C_E = effluent phosphorus concentration in mg/L
Q_S = upstream 7Q10 flow (436.7 MGD)
C_S = upstream median river phosphorus concentration (0.0267 mg/L)
Q_D = downstream flow (449.1 MGD)
C_D = downstream river phosphorus concentration (Gold Book target = 0.100 mg/L)
0.90 = factor to reserve 10% assimilative capacity
8.345 = factor to convert from MGD * mg/L to lb/day

$$M_E = [(449.1)(0.1)(0.9) - (436.7)(0.0267)] \times 8.345 = 240 \text{ lb/day}$$

Solving for M_E gives the maximum allowable mass the facility may discharge without violating water quality standards. Given that the limit is less stringent than the current limit in the 2015 Permit, the Draft Permit proposes to carry forward the limit of 236 lb/day, applicable from April through October.

Additionally, the Draft Permit also includes an ambient monitoring requirement to ensure that current ambient phosphorus data are available to use in the reassessment of the total phosphorus effluent in the next permitting cycle. Note that this ambient data will be used in the next permit reissuance, along with any other relevant information available at that time, to reevaluate whether a more stringent limit may be necessary to protect WQS. EPA notes that this ambient monitoring is particularly necessary in this case in order to better characterize the receiving water given that the best available data used above was from over 7 years ago.

5.1.10 Metals

5.1.10.1 Applicable Metals Criteria

State water quality criteria for cadmium, copper, lead, nickel and zinc are established in terms of dissolved metals. However, many inorganic components of domestic wastewater, including metals, are in particulate form, and differences in the chemical composition between the effluent and the receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total*

Recoverable Permit Limit from a Dissolved Criterion (USEPA 1996 [EPA-823-B96-007]). Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR § 122.45(c) require, with limited exceptions, that effluent limits for metals in NPDES permits be expressed as total recoverable metals.
The criteria for cadmium, copper, lead, nickel and zinc are hardness-dependent using the equations in NH Env Wq-1703. The estimated hardness of the Merrimack River downstream of the treatment plant is calculated using the critical low flow (7Q10), the design flow of the treatment plant, and the median hardness for both the receiving water upstream of the discharge and the treatment plant effluent. Effluent and receiving water data are presented in Appendix A. Using the mass balance equation discussed in Appendix B, the resulting downstream hardness is 15.7 mg/L and the corresponding criteria are also presented in Appendix B. Since this downstream hardness is below 20 mg/L, the default value of 20 mg/L was used to determine the total recoverable metals criteria. *See* Env-Wq 1703.22(f).

5.1.10.2 Acid-Soluble Aluminum Study

In a letter from NHDES to EPA (dated July 1, 2014), NHDES stated that the aluminum criteria presented in the New Hampshire water quality regulations (Env-Wq-1700) should be applied in terms of acid-soluble aluminum. The letter goes on to say:

> *New Hampshire's aluminum criteria are based on EPA's 1988 ambient water quality criteria document for aluminum. According to this document, acid-soluble aluminum is operationally defined as "[a]luminum that passes through a 0.45 um membrane filter after the sample has been acidified to a pH at between 1.5 and 2.0 with nitric acid." For the many reasons listed in the "Implementation" section of the EPA document, acid-soluble aluminum is considered a better measurement of the forms that are toxic to aquatic life or that can be readily converted to toxic forms under natural conditions.*

To express these criteria in terms of total recoverable aluminum, the fraction of acid-soluble to total recoverable aluminum in the receiving water must be determined. Based upon Manchester's 2008 permit (with a total recoverable aluminum limit of 87 µg/L) and EPA's subsequent Administrative Order (AO) in 2009, the City of Manchester was required to submit a report on the findings of one year of ambient aluminum and hardness data and a plan for either (a) filing a formal NPDES permit modification request of the limit; or (b) achieving and maintaining full compliance with the limit. The City of Manchester submitted this Aluminum Study Report (ASR) in February of 2011, requesting a formal permit modification of the aluminum limit. Based upon information presented in the ASR, EPA reevaluated the aluminum limit in terms of acid soluble consistent with the interpretation of the criteria by NHDES.

Based on the median ASA and TRA data, the fraction of acid-soluble to total recoverable aluminum in the receiving water was determined as 0.74 (64.8 / 88.0). Hence, the acid-soluble aluminum criteria of 750 µg/L (acute) and 87 µg/L (chronic) can be converted to total

recoverable criteria by dividing them by 0.74, resulting in total recoverable criteria of 1,014 µg/L (acute) and 118 µg/L (chronic). These criteria are applied in the analysis below.

5.1.10.3 Reasonable Potential Analysis and Limit Derivation

To determine whether the effluent has the reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for each metal, EPA uses the mass balance equation presented in Appendix B to project the concentration downstream of the discharge and, if applicable, to determine the limit required in the permit.

For any metal with an existing limit in the 2015 Permit, the same mass balance equation is used to determine if a more stringent limit would be required to continue to meet WQS under current conditions. The limit is determined to be the more stringent of either (1) the existing limit or (2) the calculated effluent concentration (C_e) allowable to meet WQS based on current conditions.

Based on the information described above, the results of this analysis for each metal are presented in Appendix B.

As shown, there is no reasonable potential to cause or contribute to an excursion of WQS for cadmium, lead, nickel, and zinc, so the Draft Permit does not propose any new limits for these metals. However, EPA determined that there is reasonable potential to cause or contribute to an excursion of the chronic WQS for aluminum, so the Draft Permit proposes a new aluminum limit of 118 µg/L. Additionally, there is no need for a more stringent copper limit to continue to protect WQS so the existing monthly average limit of 24 µg/L is being carried forward for the reasons specified in Appendix B.

Given that the facility only had a small number of exceedances of the proposed limit for aluminum, EPA is proposing a 12-month compliance schedule. EPA considers that this time will allow optimization of the existing treatment facility to achieve the limits consistently. EPA notes that compliance schedules must achieve compliance "as soon as possible" based on 40 CFR 122.47(a)(1).

Effluent and ambient monitoring for each of these metals will continue to be required in the WET tests.

5.1.11 Whole Effluent Toxicity

CWA §§ 402(a)(2) and 308(a) provide EPA and States with the authority to require toxicity testing. Section 308 specifically describes biological monitoring methods as techniques that may be used to carry out objectives of the CWA. Whole effluent toxicity (WET) testing is conducted to ensure that the additivity, antagonism, synergism and persistence of the pollutants in the discharge do not cause toxicity, even when the pollutants are present at low concentrations in the effluent. The inclusion of WET requirements in the Draft Permit will

assure that the Facility does not discharge combinations of pollutants into the receiving water in amounts that would be toxic to aquatic life or human health.

In addition, under CWA § 301(b)(1)(C), discharges are subject to effluent limitations based on WQSs. Under CWA §§ 301, 303 and 402, EPA and the States may establish toxicity-based limitations to implement the narrative water quality criteria calling for "no toxics in toxic amounts". *See also* 40 CFR § 122.44(d)(1). New Hampshire statute and regulations state that, "all surface waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life...." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-Wq 1703.21(a)(1)).

National studies conducted by EPA have demonstrated that domestic sources, as well as industrial sources, contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Some of these constituents may cause synergistic effects, even if they are present in low concentrations. Because of the source variability and contribution of toxic constituents in domestic and industrial sources, reasonable potential may exist for this discharge to cause or contribute to an exceedance of the "no toxics in toxic amounts" narrative water quality standard.

In accordance with current EPA guidance, whole effluent chronic effects are regulated by limiting the highest measured continuous concentration of an effluent that causes no observed chronic effect on a representative standard test organism, known as the chronic No Observed Effect Concentration (C-NOEC). Whole effluent acute effects are regulated by limiting the concentration that is lethal to 50% of the test organisms, known as the $LC_{50.}$ This policy recommends that permits for discharges having a dilution factor of between 10 and 20 require acute and chronic toxicity testing four times per year for two species. Additionally, the C-NOEC effluent limit should be greater than or equal to the receiving water concentration and the LC_{50} limit should be greater than or equal to 100%.

The chronic and acute WET limits in the 2015 Permit are C-NOEC greater than or equal to 8.5% and LC_{50} greater than or equal to 100%, respectively, using the daphnid (*Ceriodaphnia dubia*) and the fathead minnow (*Pimephales promelas*) as the test species. The Facility has consistently met these limits (Appendix A).

Based on the potential for toxicity from domestic and industrial contributions, the state narrative water quality criterion, the dilution factor of 12.5, and in accordance with EPA national and regional policy and 40 CFR § 122.44(d), the Draft Permit continues the effluent limits from the 2015 Permit including the test organism and the testing frequency. Although the updated dilution factor would result in a limit of 8.0% (1/12.5), EPA notes that the limit of 8.5% is carried forward consistent with anti-backsliding regulations discussed in Section 2.6 above. Toxicity testing must be performed in accordance with the updated EPA Region 1 WET test procedures and protocols specified in Attachments A, *Freshwater Acute Toxicity Test Procedure*

and Protocol (February 2011) and Attachment B, *Freshwater Chronic Toxicity Test Procedure and Protocol* (March 2013) of the Draft Permit.

In addition, EPA's 2018 *National Recommended Water Quality Criteria* for aluminum are calculated based on water chemistry parameters that include dissolved organic carbon (DOC), hardness and pH. New Hampshire is in the process of adopting these aluminum criteria and therefore DOC hard ness and pH data may be needed in the next permit reissuance to determine the appropriate aluminum criteria at that time. Since aluminum monitoring is required as part of each WET test, an accompanying new testing and reporting requirement for DOC, in conjunction with each WET test, is warranted in order to assess potential impacts of aluminum in the receiving water.

5.1.12 Per- and polyfluoroalkyl substances (PFAS)

As explained at https://www.epa.gov/pfas, PFAS are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products. PFAS manufacturing and processing facilities, facilities using PFAS in production of other products, airports, and military installations can be contributors of PFAS releases into the air, soil, and water. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. Exposure to some PFAS above certain levels may increase risk of adverse health effects.[13] EPA is collecting information to evaluate the potential impacts that discharges of PFAS from wastewater treatment plants may have on downstream drinking water, recreational and aquatic life uses.

Background Information for New Hampshire

On September 30, 2019, NH DES adopted Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) for drinking water at Env-DW 705.06 and Ambient Groundwater Quality Standards (AGQs) at Env-Or 603 for the following PFAS:

	MCLs/AGQs	MCLGs
Perfluorohexanesulfonic acid (PFHxS)	18 ng/L	0
Perfluorononanoic acid (PFNA)	11 ng/L	0
Perfluorooctanesulfonic acid (PFOS)	15 ng/L	0
Perfluorooctanoic acid (PFOA)	12 ng/L	0

The September 2019 PFAS regulations were challenged in state court and are currently enjoined pending resolution of the litigation. On July 23, 2020, the New Hampshire legislature enacted legislation establishing MCLs and AGQSs for these PFAS in State statute at the identical levels as the challenged regulations. The statutory MCLs and AGQSs became effective on July 23, 2020.

[13] EPA, *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan,* EPA 823R18004, February 2019. Available at: https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf

Since PFAS chemicals are persistent in the environment and may lead to adverse human health and environmental effects, and consistent with recent EPA guidance,[14] the Draft Permit requires that the Facility conduct quarterly influent, effluent and sludge sampling for PFAS chemicals and annual sampling of certain industrial users. The quarterly monitoring shall begin the first full calendar quarter beginning six months after the effective date of the permit. The annual monitoring for certain industrial users shall begin the first full calendar year following the effective date of the permit.

The purpose of this monitoring and reporting requirement is to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits on a facility specific basis. EPA is authorized to require this monitoring and reporting by CWA § 308(a), which states:

> "SEC. 308. (a) Whenever required to carry out the objective of this Act, including but not limited to (1) developing or assisting in the development of any effluent limitation, or other limitation, prohibition, or effluent standard, pretreatment standard, or standard of performance under this Act; (2) determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance; (3) any requirement established under this section; or (4) carrying out sections 305, 311, 402, 404 (relating to State permit programs), 405, and 504 of this Act—
>
> (A) the Administrator shall require the owner or operator of any point source to (i) establish and maintain such records, (ii) make such reports, (iii) install, use, and maintain such monitoring equipment or methods (including where appropriate, biological monitoring methods), (iv) sample such effluents (in accordance with such methods, at such locations, at such intervals, and in such manner as the Administrator shall prescribe), and (v) provide such other information as he may reasonably require;".

(See 40 CFR § 122.21(e)(3)(ii) and 40 CFR § 122.44(i)(1)(iv)(B)).

In the absence of a final 40 CFR § 136 method for measuring PFAS in wastewater and sludge, the Draft Permit requires the use of Method 1633 which was finalized in January 2024. Monitoring should include each of the 40 PFAS parameters detectable by Method 1633 (see Draft Permit Attachment B for list of PFAS parameters) and the monitoring frequency is quarterly. Reporting of all 40 PFAS analytes is necessary to address the emerging understanding and remaining uncertainties regarding sources and types of analytes of PFAS in wastewater and

[14] Radhika Fox, Assistant Administrator, EPA to Water Division Directors, EPA Regions 1-10, December 5, 2022, Subject: "Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs." Available at: https://www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf

their impacts. While NHDES has currently adopted MCLs for only 4 of these analytes as described above, it is possible that MCLs, water quality criteria and/or effluent limitation guidelines could be adopted for many of the other 36 analytes measured by Method 1633 during the life of the permit. Therefore, EPA considers it prudent to require reporting for all 40 analytes that are measured using Method 1633 to ensure EPA has sufficient data to address each of these PFAS analytes in the future. This level of monitoring is recommended in EPA's *October 2021 PFAS Strategic Roadmap*[15] and in an EPA memo dated April 28, 2022, called *Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority*[16]*.*

All PFAS results must be reported on DMRs (see 40 CFR § 122.41)(l)(4)(i). This approach is consistent with 40 CFR § 122.44(i)(1)(iv)(B) which states that in the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR Part 136 or methods are not otherwise required under 40 CFR chapter I, subchapter N or O, monitoring shall be conducted according to a test procedure specified in the permit for such pollutants or pollutant parameters.

Additionally, EPA has recently published Method 1621 to screen for organofluorines in wastewater. Organofluorines (molecules with a carbon-fluorine bond) are rarely naturally occuring and the most common source of organofluorines are PFAS and non-PFAS fluorinated compounds such as pesticides and pharmaceuticals. The Permittee shall monitor Adsorbable Organic Fluorine using Method 1621 once per quarter concurrently with PFAS monitoring to screen for a broader range of these types of emerging contaminants. This requirement also takes effect the first full calendar quarter following six months after the effective date of the permit.

All monitoring results may be used by EPA in the next permit reissuance to ensure the discharge continues to protect designated uses and meets water quality standards.

5.2 Industrial Pretreatment Program

The Permittee is required to administer a pretreatment program under 40 CFR Part 403. *See also* CWA § 307; 40 CFR § 122.44(j). The Permittee's pretreatment program received EPA approval on February 27, 1985 and, as a result, appropriate pretreatment program requirements were incorporated into the previous permit, which were consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

The Federal Pretreatment Regulations in 40 CFR part 403 were amended in October 1988, in July 1990, and again in October 2005. Those amendments established new requirements for implementation of pretreatment programs. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with current

[15] https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf
[16] https://www.epa.gov/system/files/documents/2022-04/npdes_pfas-memo.pdf

Federal Regulations. The activities that the permittee must address include, but are not limited to, the following: 1) develop and enforce EPA-approved specific effluent limits (technically-based local limits); 2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; 3) develop an enforcement response plan; 4) implement a slug control evaluation program; 5) track significant noncompliance for industrial users; and 6) establish a definition of and track significant industrial users.

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

In addition to the requirements described above, the Draft Permit requires the Permittee to submit to EPA in writing, within 180 days of the permit's effective date, a description of proposed changes to permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the Draft Permit to ensure that the pretreatment program is consistent and up to date with all pretreatment requirements in effect. Lastly, the Permittee must continue to submit, annually by August 1st, a pretreatment report detailing the activities of the program for the twelve-month period ending 60 days prior to the due date.

5.3 Sludge Conditions

Section 405(d) of the Clean Water Act requires that EPA develop technical standards regarding the use and disposal of sewage sludge. On February 19, 1993, EPA promulgated technical standards. These standards are required to be implemented through permits. The conditions in the permit satisfy this requirement.

The City of Manchester owns and operates one fluidized bed incinerator. The incinerator has the following air pollution control devices: a venturi scrubber which removes particulate matter and volatile metals; a spray down scrubber which removes acid gases and additional metals; an electrodynamic venturi which removes fine particulates and metals. The City generates approximately 4,500 dry metric tons of sewage sludge annually. In addition to sewage sludge, the City also incinerates scum. The resulting ash is disposed off-site by private contract issued on an annual basis. At the present time ash removal and disposal is done by Resource Management Inc. Disposal of ash is not regulated by Part 503.

Subpart E of the Part 503 regulations outlines the standards for the incineration of sewage sludge. The permit contains general requirements, management practices, pollutant limitations, an operational standard, monitoring frequency, record keeping and reporting requirements implementing the provisions of the regulations. The basis of each provision is detailed below.

Pollutant Limitations:

The sludge standards regulate the following seven metals: mercury, beryllium, arsenic, cadmium, chromium, nickel and lead. The pollutant limits in the permit are based on the requirements in §503.43.

Mercury and beryllium are regulated by the National Emission Standard for Hazardous Air Pollutants (NESHAPs) found in 40 CFR Part 61. The permit requires that the firing of sewage sludge in the facility's incinerators does not cause the violation of the NESHAPs for mercury and beryllium. The NESHAP for beryllium applies to each incinerator. The NESHAP for mercury applies to the facility.

The allowable sludge concentrations for arsenic, cadmium, chromium, and nickel are calculated from Equation (5) in §503.43(d):

$$C = \frac{RSC \times 86{,}400}{DF \times (1 - CE) \times SF} \qquad \text{Eq. (5)}$$

Where:

- C = Daily concentration of pollutant in sewage sludge in mg/kg of total solids (dry weight basis)
- CE = control efficiency for the incinerator - based on performance tests
- DF = dispersion factor in micrograms per cubic meter per gram per second
- RSC = risk specific concentration in micrograms per cubic meter
- SF = sewage sludge feed rate in metric tons per day (dry weight basis)

The parameters, with the exception of RSC, are site specific to the Manchester's incinerator. The RSC is derived for each pollutant based on a risk assessment.

The RSC is the allowable increase in the average daily ground level ambient air concentration for a pollutant above background levels that result from the firing of sewage sludge in an incinerator. It is equivalent to the amount of a pollutant that a person living near the incinerator can inhale with a probability of 1 in 10,000 that the person will contract cancer as a result of inhaling the pollutant. The RSC was calculated from the equation below, which is found in the *Technical Support Document for Sewage Sludge Incineration* (EPA 822/R-93-003, November 1992):

$$RSC = \frac{RL \times BW}{Q^* \times I_a} \times 10^3$$

Where:

- RL = Risk Level, 10^{-4}
- BW = body weight, 70 kg (154 lbs), this is the average weight of an adult male

Q^* = allowable dose of a pollutant from EPA's Integrated Risk Information System database

I_a = inhalation rate, 20 m/day, normal inhalation rate for an adult male.

The RSC calculated from this equation is intended to protect the "Highly Exposed Individual" (HEI). The HEI is a person who remains for an extended period of time, 70 years, at the point of maximum ground level pollutant concentration. The RSC values for the regulated metals are found in Tables 1 and 2 of § 503.43 and are presented below.

Pollutant	RSC (ug/m^3)
Arsenic	0.023
Cadmium	0.057
Chromium	0.65*
Nickel	2.0

*Chromium RSC based on fluidized bed with wet scrubber

The sludge feed rate, dispersion factor and control efficiency (based on performance stack test) are:

Sludge Feed Rate: 29.71 metric tons/day
Dispersion factor: 1.66 ug/m^3/g/sec

Pollutant	Control Efficiency (%)
Arsenic	99.53
Cadmium	99.77
Chromium	99.92
Lead	99.90
Nickel	98.36

Based on the above parameters, the concentration limits for each pollutant are calculated below using Equation (5) in §503.43(d):

Pollutant	Limit (mg/kg)
Arsenic	8,573
Cadmium	43,416
Chromium	1,423,398
Nickel	213,643

The pollutant limit for lead is calculated using equation (4) of §503.43:

$$C = \frac{0.1 \times NAAQS \times 86{,}400}{DF \times (1 - CE) \times SF} \qquad \text{Eq. (4)}$$

Instead of using an RSC, a percentage of the National Ambient Air Quality Standard (NAAQS) for lead was used. The NAAQS for lead (1.5 ug/m^3) is found in 40 CFR § 50.12. Although lead is classified as a probable human carcinogen, the Clean Air Science Advisory Committee of the Science Advisory Board recommended that the NAAQS for lead be based on the noncarcinogenic effects. Developmental neurotoxicity is considered to be the most sensitive end point for lead exposure. The calculated concentration from equation (4) shown below also protects the HEI described above.

Pollutant	Limit (mg/kg)
Lead	262,781

The limits for arsenic, cadmium, chromium, nickel and lead are the same as in the 2015 Permit, given that the regulations have not changed and in accordance with anti-backsliding requirements found at 40 CFR § 122.44(l).

Operational Standard:

The Part 503 regulations have an operational standard for total hydrocarbons (THC). Hydrocarbons are simple organic compounds containing carbon and hydrogen. The standard is designed to regulate organic emissions from sewage sludge incinerators. THC represent a subset of organic compounds and is used in the regulation since it is impractical to attempt to monitor sludges or stack emissions for all organic compounds which may be present.

The THC value must be corrected to seven percent oxygen and zero percent moisture. The correction to seven percent oxygen is used because seven percent is the standard amount of oxygen used to reference measurements of pollutant limits expressed as concentration; it is also equivalent to 50 percent excess air (excess air is air added to a system above the amount of air needed for complete combustion to occur); and without the correction, inaccurate readings may occur because the presence of the additional oxygen may dilute the THC reading. Similarly, the correction for moisture is needed since the presence of moisture can also dilute the actual THC reading. THC is conventionally expressed in terms of a dry volumetric basis, hence the need to set the standard based on zero moisture.

On February 25, 1994, §503.40 was amended. The amendment allows facilities to monitor carbon monoxide (CO) instead of THC. A facility can monitor for CO if the facility can meet a monthly average concentration CO limit of 100 parts per million on a volumetric basis. This limit, like the THC limit, is corrected to seven percent oxygen and zero percent moisture. The City of Manchester monitors CO.

Management Practices:

The permit contains management practices based on §503.45 pertaining to the operation of the incinerator. The management practices include maintaining the instruments which monitor CO, oxygen and temperature; proper operation of all air pollution control devices; and

notification to EPA when the continuous monitoring equipment is not operational for a period of 72 hours or more.

The permit requires notification to EPA and the state if any monitoring equipment is broken or shut down for longer than 72 hours. It also prohibits adversely affecting a threatened or endangered species or their critical habitat. There are no known threatened or endangered species within the vicinity of the incinerator. Therefore, EPA has determined that the activity will not affect a threatened or endangered species.

The monitoring frequency is based on §503.46. The Permittee is required to monitor heavy metals 6 times per year. The monitoring for mercury and beryllium is at the frequency required by 40 CFR Part 61. The record keeping requirements are based on §503.47.

5.4 Infiltration/Inflow (I/I)

Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems, and combined sewer overflows (CSOs) in combined systems.

The Draft Permit includes a requirement for the permittee to control infiltration and inflow (I/I) within the sewer collections system it owns and operates. The permittee shall develop an I/I removal program commensurate with the severity of I/I in the collection system. This program may be scaled down in sections of the collection system that have minimal I/I.

5.5 Operation and Maintenance

5.5.1 Adaptation Planning for the Wastewater Treatment System (WWTS) and/or Sewer System

The Draft Permit, in Part I.C.1. requires the Permittee and Co-permittee(s) to develop an Adaptation Plan to address major storm and flood events as part of their operation and maintenance planning for the part of the WWTS and/or sewer systems that they each own and operate. These requirements are new. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of the WWTS and/or sewer system and has included a schedule in the Draft Permit for completing these requirements.

See Appendix C for a further rationale regarding this Adaptation Plan.

5.5.2 Operation and Maintenance of the Sewer System

The standard permit conditions for 'Proper Operation and Maintenance', found at 40 CFR § 122.41(e), require the proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. The requirements at 40 CFR § 122.41(d) impose a 'duty to mitigate' upon the permittee, which requires that "all reasonable steps be taken to minimize or prevent any discharge violation of the permit that has a reasonable likelihood of adversity affecting human health or the environment. EPA and MassDEP maintain that an I/I removal program is an integral component of ensuring permit compliance with the requirements of the permit under the provisions at 40 CFR § 122.41(d) and (e).

General requirements for proper operation and maintenance, and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.C. and I.D. of the Draft Permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to separate sewer collection systems (combined systems are not subject to I/I requirements) to the extent necessary to prevent SSOs and I/I related effluent violations at the Wastewater Treatment Facility and maintaining alternate power where necessary. These requirements are included to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment.

Some of the requirements in the Draft Permit are not included in the 2015 Permit. EPA has determined that this additional requirement is necessary to ensure the proper operation and maintenance of the collection system and has included schedules for completing these requirements in the Draft Permit.

Because the Towns of Goffstown, Bedford, and Londonderry own and operate a collection system that discharges to the Manchester WWTF, they have been included as Co-permittees for the specific permit requirements discussed in the paragraph above. The historical background and legal framework underlying this Co-permittee approach is set forth in Appendix D to this Fact Sheet, *EPA Region 1 NPDES Permitting Approach for Publicly Owned Treatment Works that Include Municipal Satellite Sewage Collection Systems*.

5.6 Combined Sewer Overflows

<u>Description and History</u>

The City of Manchester owns and operates a wastewater collection system comprised of 55 percent sanitary sewers, which carry domestic, industrial, and commercial wastewater; and 45 percent combined sewers, which carry domestic, industrial, and commercial wastewater plus stormwater runoff. Manchester's wastewater collection system consists of ten pumping stations and approximately 385 miles of sewers. The WWTF serves the majority of Manchester

along with portions of Bedford, Goffstown and Londonderry. The Goffstown, Bedford and Londonderry have separate sewer systems. There are 15 CSO outfalls remaining in the Manchester wastewater collection system and interceptor network. Of the 15 remaining CSO outfalls, 2 discharge to the Piscataquog River (adjacent to Bass Island and immediately upstream of the river's confluence with the Merrimack River), 2 discharge to the Merrimack River from the west side of the city, and 11 discharge to the Merrimack River from the east side of the city (including Tannery Brook and Ray Brook). During certain wet weather events, discharges of untreated sanitary wastewater and stormwater occur from the City's 15 combined sewer overflow outfalls ("CSOs") into the Piscataquog and Merrimack Rivers, as listed in Table 1 below.

CSO discharge data summaries from 2018-2023 are shown in Appendix E.

The City submitted a Long-Term Control Plan (LTCP) in 1995 which identified the CSO controls necessary to comply with water quality standards and the NPDES permit in effect at that time. In March of 1999, the city and the EPA entered into a negotiated Compliance Order (CO) that established a 10-year $58 million Phase I CSO abatement program (Phase I). The measures included in the Phase I CSO abatement program were completed, and the City subsequently submitted a revised Long-Term Control Plan in 2010 to address the remaining CSOs.
On July 13, 2020, EPA and the City of Manchester entered into a Consent Decree which contains a schedule to complete the CSO abatement measures identified in the revised 2010 LTCP.

Consistent with the Consent Decree, the City has completed the following projects to reduce and/or eliminate discharges from CSOs: (1) Wastewater Treatment Plant Improvements: Increased primary and secondary treatment capacity to 42 MGD and increased primary treatment and disinfection of flows from 42 MGD – 72 MGD; (2) Program Assessment and Reporting: Semi-annual compliance report submittal (ongoing); (3) System Optimization With Real Time Controls: Completed study of system optimization with real time controls; (4) evaluation of inactive CSOs for permanent closure; (5) Cemetery Brook Separation Project: Drain Basis of Design Report submitted; Cemetery Brook drain tunnel design – 60% of the design submitted- The Cemetery Brook Drain Tunnel project will significantly reduce the impacts of CSO discharges by removing stormwater inflow from the collection system. The tunnel is anticipated to significantly reduce wet weather overflows; (6) Christian Brook Separation Project: Christian Brook Main Drain – flow redirected to the City's new drainage system; and (7) CSO discharge and notification program.

Table 4: Manchester CSO Outfall Locations

Outfall	CSO Regulator Name	Receiving Water	Latitude	Longitude
011	Schiller Street	Merrimack River	42° 58' 18.86" N	071° 28' 26.42" W
018	Turner/Ferry Streets	Merrimack River	42° 58' 52.84" N	071° 28' 10.17" W
031	Stark Brook (Elgin Ave.) Stark Brook (Sixth Ave.) Stark Brook (Eve Ave.)	Merrimack River	43° 01' 39.84" N	071° 28' 44.02" W
039	Third Street	Piscataquog River	42° 58' 45.12" N	071° 28' 24.93" W
043	Tannery Brook	Merrimack River	42° 58' 05.97" N	071° 28' 23.13" W
044	Cemetery Brook (Primary) Cemetery Brook (Secondary)	Merrimack River	42° 58' 52.88" N	071° 28' 02.40" W
045	Granite Street	Merrimack River	42° 59' 08.00" N	071° 28' 08.80" W
046	Bridge Street	Merrimack River	42° 59' 38.51" N	071° 28' 08.11" W
047	Penacook Street	Merrimack River	42° 59' 55.35" N	071° 28' 06.27" W
050	MH #1	Merrimack River	42° 56' 49.34" N	071° 27' 33.81" W
051	West Side Pump Station	Piscataquog River	42° 58' 41.64" N	071° 28' 16.87" W
052	MH #2	Merrimack River	42° 56' 57.36" N	071° 27' 40.80" W
053	Walnut/North Street Canal/W. Penacook	Merrimack River	43° 00' 02.43" N	071° 28' 09.46" W
054	Ray Brook	Merrimack River	43° 00' 30.53" N	071° 28' 17.16" W
055	Dunbar Street	Merrimack River	42˚ 57’ 56” N	071˚ 28’ 26” W

Regulatory Framework

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

1) To ensure that if the CSO discharges occur, they are only as a result of wet weather;

2) To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the CWA and applicable federal and state water quality standards;

and

3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

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

To reflect advances in technologies, the Draft Permit includes more specific public notification implementation level requirements to ensure that the public receives adequate notification of CSO occurrences and CSO impacts. The Draft Permit requires the permittee to develop a public notification plan to fulfill NMC #8. As part of this plan, notification shall be provided electronically to any interested party, and a posting made on the permittee's website, of a probable CSO activation within two (2) hours of the initiation of any CSO discharge(s). Subsequently, within 24 hours of the termination of any CSO discharges(s), the permittee shall provide follow-up information on their website and in a follow-up electronic communication to any interested party. EPA invites comment on this new requirement doing the public comment period with a goal of a workable public notification plan.

The CSO Policy also recommended that each community that has a combined sewer system develop and implement a long-term CSO control plan ("LTCP") that will ultimately result in compliance with the requirements of the CWA. As discussed above, the City submitted a draft LTCP in 1995 and a revised draft LTCP in 2010.

Permit Requirements

In accordance with the National CSO Policy, the Draft Permit contains the following conditions for the CSO discharges:

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

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

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

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

5.7 Standard Conditions

The standard conditions of the permit are based on 40 CFR §122, Subparts A, C, and D and 40 CFR § 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

6.0 Federal Permitting Requirements

6.1 Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority and imposes requirements on Federal agencies regarding endangered or threatened species of fish, wildlife, or plants (listed species) and habitat of such species that has been designated as critical (a "critical habitat").

Section 7(a)(2) of the ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to ensure that any action it authorizes, funds or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) administers Section 7 consultations for marine and anadromous species.

The Federal action being considered in this case is EPA's proposed NPDES permit for the Manchester Wastewater Treatment Facility. The Draft Permit is intended to replace the 2015 Permit in governing the Facility. As the federal agency charged with authorizing the discharge from this Facility, EPA determines potential impacts to federally listed species, and initiates consultation, when required under Section 7(a)(2) of the ESA.

Regarding protected species under the jurisdiction of NOAA Fisheries, a number of anadromous and marine species and life stages are present in New Hampshire waters. Various life stages of protected fish, sea turtles and whales have been documented in New Hampshire's coastal and inland waters, either seasonally or year-round. In general, adult and subadult life stages of Atlantic sturgeon (*Acipenser oxyrinchus*) and adult shortnose sturgeon (*Acipenser brevirostrom*) are present in coastal waters. These sturgeon life stages are also found in some river systems in

New Hampshire, along with early life stages of protected sturgeon and juvenile shortnose sturgeon.

Protected marine species, including adult and juvenile life stages of leatherback sea turtles (*Dermochelys coriacea*), loggerhead sea turtles (*Caretta caretta*), Kemp's ridley sea turtles (*Lepidochelys kempii*) and green sea turtles (*Chelonia mydas*) are found in coastal waters and bays. Adult and juvenile life stages of North Atlantic right whales (*Eubalaena glacialis*) and fin whales (*Balaenoptera physalus*) have also been documented in coastal waters and bays. Those coastal areas have been designated as critical habitat for North Atlantic right whale feeding.

In this case, the Facility's outfall and action area do not overlap with coastal waters where protected marine species are found. The Facility discharges directly into the Merrimack River, which travels through New Hampshire and then into Massachusetts and subsequently to an estuary system and out to the Atlantic Ocean. The facility is located approximately 35 miles upstream from the Essex Dam in Lawrence, Mass., which is the upstream limit for two species of anadromous fish, the shortnose sturgeon (*Acipenser brevirostrom*) and the Atlantic sturgeon (*Acipenser oxyrhynchus*). In general, adult shortnose sturgeon (SNS) and adult Atlantic sturgeon (ATS) are present in coastal waters. Sturgeon species have not previously been reported in the vicinity of the action area and are unlikely to be present so far upstream of the Essex Dam.

On the basis of the evaluation, EPA's preliminary determination is that this action is not likely to adversely affect, the life stages of the protected species which are expected to inhabit the Merrimack River in the vicinity of the action area of the discharge. Therefore, EPA has judged that a formal consultation pursuant to section 7 of the ESA is not required.

For protected species under the jurisdiction of the USFWS, two listed species, the endangered northern long-eared bat (*Myotis septentrionalis*) and the threatened small whorled pogonia (*Isotria medeoloides*), were identified as potentially occurring in the action area of the Facility's discharges. According to the USFWS, the endangered northern long-eared bat is found in the following habitats based on seasons, "winter – mines and caves; summer – wide variety of forested habitats." The small whorled pogonia "grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams." Neither of these species is considered aquatic.

Because the Facility's projected action area in Manchester, New Hampshire overlaps with the general ranges of these species, EPA submitted an evaluation on potential effects of the project to the Information for Planning and Consultation (IPaC) system provided by the USFWS. The USFWS system confirmed by letter on January 31, 2024 that, based on the specific project information submitted, the project would have "no effect" on the northern long-eared bat or small whorled pogonia[17]. This concluded EPA's consultation responsibilities for the Manchester

[17] USFWS IPaC Project code: 2024-0043023 Letter dated 1/31/2024

WWTF NPDES permitting action under ESA section 7(a)(2). No ESA section 7 consultation is required with USFWS for these species.

At the beginning of the public comment period, EPA notified USFWS and NOAA Fisheries Protected Resources Division that the Draft Permit and Fact Sheet were available for review and provided a link to the EPA NPDES Permit website to allow direct access to the documents.

EPA finds that adoption of the proposed permit is not likely to adversely affect any threated or endangered species or its critical habitat and informal consultation with NOAA Fisheries or USFWS under Section 7 of the ESA is required. Initiation of consultation is required and shall be requested by the EPA or by USFWS/NOAA Fisheries where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the analysis; (b) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this analysis; or (c) If a new species is listed or critical habitat designated that may be affected by the identified action. No take is anticipated or exempted. If there is any incidental take of a listed species, initiation of consultation would be required.

6.2 Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (*see* 16 U.S.C. § 1801 *et seq.*, 1998), EPA is required to consult with the NOAA Fisheries if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b).

The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 U.S.C. § 1802(10). "Adverse impact" means any impact that reduces the quality and/or quantity of EFH 50 CFR § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), or site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.
EFH is only designated for fish species for which federal Fisheries Management Plans exist. *See* 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b) (1) (A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. A New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment in 2017 updated the descriptions.[18] In some cases, a narrative identifies rivers and other waterways that should be considered EFH

[18] The information is included on the NOAA Fisheries website at:
https://www.fisheries.noaa.gov/national/habitatconservation/essential-fish-habitat.

due to present or historic use by federally managed species. In a letter to EPA New England dated October 10, 2000, NOAA Fisheries agreed that for NPDES permit actions, EFH initial notification for purposes of consultation can be accomplished in the EFH section of the Draft Permit's supporting Fact Sheet.

The Federal action being considered in this case is EPA's proposed NPDES permit for the Manchester WWTF, which discharges though Outfall 001 and 15 CSOs to the Merrimack River and other waters identified in Table 1 in Section 4.1 of this document. A review of the relevant essential fish habitat information provided by NOAA Fisheries indicates that the outfall exists within designated EFH for one federally managed species, Atlantic salmon (*Salmo salar*). This is because the Manchester WWTF discharge to the Merrimack River. The Merrimack River system has been designated as EFH for Atlantic salmon. Therefore, consultation with NOAA Fisheries under the Magnuson-Stevens Fishery Conservation and Management Act is required. EPA has determined that actions regulated by the Draft Permit may adversely affect EFH. The Draft Permit has been conditioned in the following way to minimize any impacts that reduce the quality and/or quantity of EFH for Atlantic salmon.

The Draft Permit has been conditioned in the following way to minimize any impacts that reduce the quality and/or quantity of EFH.

- This Draft Permit action does not constitute a new source of pollutants. It is the reissuance of an existing NPDES permit;
- The Facility withdraws no water from the Merrimack River, so the EFH will not be reduced in quality and/or quantity through impingement or entrainment of EFH designated species or their prey;
- Acute and chronic toxicity tests will be conducted quarterly to ensure that the discharge does not exhibit toxicity;
- Total suspended solids, biochemical oxygen demand, pH, *Escherichia coli*, total phosphorus, total aluminum, total lead, total copper, and acute toxicity are regulated by the Draft Permit to meet water quality standards;
- The Draft Permit prohibits the discharge of pollutants or combination of pollutants in toxic amounts;
- The effluent limitations and conditions in the Draft Permit were developed to be protective of all aquatic life;
- The Draft Permit prohibits violations of the state water quality standards; and
- The Draft Permit requirements minimize any reduction in quality and/or quantity of EFH, either directly or indirectly.
- The Draft Permit requires monitoring for four Per- and Polyfluoroalkyl Substances (PFAS) in the influent, effluent, and sludge.

7.0 Public Comments, Hearing Requests and Permit Appeals

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the permit writer, Robin Johnson at the following email address: to Johnson.Robin@epa.gov.

Prior to the close of the public comment period, any person may submit a written request to EPA for a public hearing to consider the Draft Permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held if the criteria stated in 40 CFR § 124.12 are satisfied. In reaching a final decision on the Draft Permit, EPA will respond to all significant comments in a Response to Comments document attached to the Final Permit and make these responses available to the public on EPA's website.

Following the close of the comment period, and after any public hearings, if such hearings are held, EPA will issue a Final Permit decision, forward a copy of the final decision to the applicant, and provide a copy or notice of availability of the final decision to each person who submitted written comments or requested notice. Within 30 days after EPA serves notice of the issuance of the Final Permit decision, an appeal of the federal NPDES permit may be commenced by filing a petition for review of the permit with the Clerk of EPA's Environmental Appeals Board in accordance with the procedures at 40 CFR § 124.19.

If for any reason, comments on the Draft Permit and/or a request for a public hearing cannot be emailed to the permit writer specified above, please contact them at telephone number: (617) 918-1045.

8.0 Administrative Record

The administrative record on which this Draft Permit is based may be accessed by contacting Robin Johnson at 617-918-1045 or via email to Johnson.Robin@epa.gov.

April 2024
Date

Ken Moraff, Director
Water Division
U.S. Environmental Protection Agency

Figure 1: Location Map

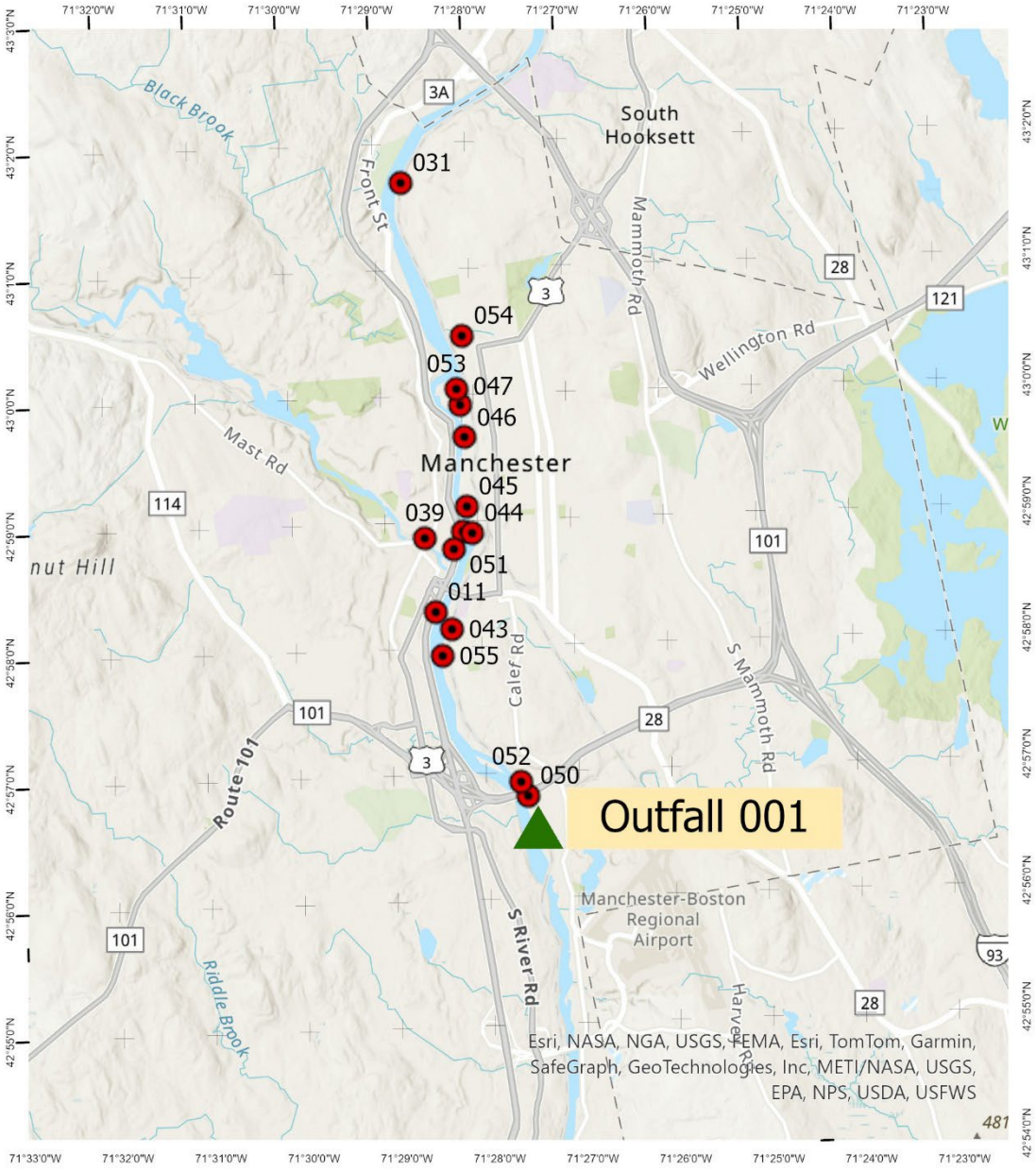

FIGURE 1
Site Location Map

Manchester Wastewater
Treatment Facility
300 Winston Street
Manchester, NH 03103
NPDES No. NH0100447

1/31/2024

Figure 2: Flow diagram