City of Portsmouth, New Hampshire

Wastewater Master Plan

Technical Memorandum

TM 2

REGULATORY REQUIREMENTS REVIEW

Tasks:	2.1 through 2.3	
Status:	**Submitted to EPA and NHDES**	10/18/07

1. Introduction and Purpose

This Technical Memorandum (TM) was prepared to satisfy the requirements of Task 2 as set forth in the Work Plan for the City of Portsmouth, New Hampshire Wastewater Master Plan (WMP). The TM reviews the regulatory framework associated with Wastewater Facilities Plans (WWFPs) and Combined Sewer Overflow (CSO) Long Term Control Plans (LTCP) and, more specifically, enforcement orders and discharge permits issued to the City of Portsmouth pertaining to the its wastewater collection and treatment system. Components of both WWFPs and LTCPs will be included in the WMP in response to the City's loss of the 301(h) waiver for the advanced-primary Peirce Island Wastewater Treatment Facility (WWTF).

2. Review of Pertinent EPA Documents

Pertinent U.S. Environmental Protection Agency (EPA) and U.S. Department of Justice documents are listed below:

a. EPA National Pollutant Discharge Elimination System (NPDES) Permit No. NH0100234 for the Peirce Island WWTF
   - January 1985 (*Expired*)
   - April 2007 (*Active*)

b. EPA NPDES Permit No. NH0090000 for the Pease WWTF
   - August 2000 (*Active*)

c. U.S. Department of Justice Consent Decree, Civil No. 89-234-S signed November 1990.

d. EPA Administrative Orders:
   - Docket 02-15 in July 2002 (*Expired*)
   - Docket No. 07-016, signed August 2007 (*Active*)

The State of New Hampshire Department of Environmental Services (NHDES), either directly or indirectly, is a party to these documents with respect to review and/or compliance responsibilities.

NPDES permits regulate the volume and effluent quality of the wastewater discharges from the City's WWTFs and CSOs and establish monitoring and reporting requirements. The permit limits for the City's two WWTFs are summarized in Table 1.

In 1990, the City and EPA entered into a Consent Decree to bring the Peirce Island WWTF into compliance with the requirements of the January 1985 NPDES Permit by February 1992, and to complete what will be referred to as the City's CSO Abatement Program by January 1991. The City met these conditions.

The July 2002 Administrative Order (AO) was issued following a series of negotiations between the City, EPA and NHDES in the intervening period following completion of the CSO Abatement Program, submitted in 1991 but never approved, and the construction, start-up and operation of the upgraded advanced-primary Peirce Island WWTF. The AO included the following additional requirements: an update of the 1991 CSO Abatement Program to be submitted by August 2002; development of a Preliminary Design Report for mitigation of the CSOs by February 2003; and Advertisement for Bids for Contract 1, sewer separation in the Lincoln Ave. sewer shed tributary to CSOs 010A and 010B by March 2003. The City met these requirements.

Although currently an advanced-primary WWTF, the newly issued 2007 permit requires these secondary treatment limits for the Peirce Island WWTF along with a geometric-mean fecal coliform limit of 14/100 ml.

The August 2007 AO was issued following issuance of the April 2007 NPDES Permit. Because the advanced-primary Peirce Island WWTF was unable to meet the new secondary treatment requirements, it was no longer permit-compliant. This latest AO requires the following actions: completion of Tasks 1 and 2 of the WMP Work Plan, submitted to EPA and NHDES in May 2007, by October 19, 2007; compliance with interim effluent monitoring and limitations including 150 mg/L for BOD5 and 95 mg/L for TSS; and an evaluation of the violations to the Whole Effluent Toxicity testing program. These requirements are underway including the preparation of this TM in response to the first requirement as part of the development of the WMP.

Table 1. City of Portsmouth NPDES Permits

Constituent	Peirce Island WWTF		Pease Development Authority WWTF
	A.O. August 2007	A.O. April 2007 (Active)	August 2000 (Active)
BOD_5	150 mg/L avg.monthly	30 mg/L avg-monthly 45 mg/L max-weekly 50 mg/L max-daily	30 mg/L avg-monthly 45 mg/L max-weekly 50 mg/L max-daily
TSS	95 mg/L avg. monthly	30 mg/L avg-monthly 45 mg/L max-weekly 50 mg/L max-daily	30 mg/L avg-monthly 45 mg/L max-weekly 50 mg/L max-daily
Bacteria		Fecal Coliform 14/100 ml (geometric mean)[1]	Fecal Coliform 14/100 ml (geometric mean)

[1] No more than 10% of samples may exceed 43/100 ml.

The Pease Development Authority WWTF, which serves the Pease International Tradeport, has a secondary treatment permit with TSS and BOD5 effluent limits of 30 mg/L, 45 mg/L and 50 mg/L for average-monthly, maximum- weekly and maximum-daily conditions, respectively.

3. Review of EPA and NHDES WWFP and LTCP Requirements and Guidance Documents

EPA issued guidance on Facilities Plans in 1981 during the period when their Construction Grants Program was active. The NHDES has similar guidance for facilities planning, or the so-called report phase, with both calling for a detailed review of wastewater flow and loading projections, alternative treatment processes and cost-effective analysis. In addition, EPA also published a series of companion guideline on performing Sewer System Evaluation Surveys, which focused on the identification and removal of what was determined to be cost-effective infiltration and inflow, or I/I.

The City of Portsmouth prepared its latest Facilities Plan Update in 1999. The plan addressed a number of issues associated with the performance of the advanced-primary WWTF. The plan also addressed a number of collection system problems that were later also addressed in the 2005 LTCP as will be discussed below. The City has implemented a number of the plan's recommendations including optimization of the operation of the advanced-primary WWTF.

EPA began issuing guidance documents and policies for CSO evaluations and abatement in the late 1980s culminating in the issuance of the CSO Control Policy in 1994. This document has since become formalized as a regulation. EPA has also issued a series of guidance documents dealing with such matters as LTCP development, affordably analysis and water quality standards coordination.

The CSO Control Policy contains numerous provisions addressing implementation schedules, compliance with water quality standards and minimum levels of treatment. One of the most significant provisions of the policy relates to the presumption of meeting applicable water quality standards. The policy states that the CSO community, or the permittee, if allowed by the permitting authority, could discharge untreated CSOs up to four or more times per year and still be considered to meet applicable water quality standards. A capture rate of 85 percent of the annual CSO volume is also required. EPA is the permitting authority in New Hampshire, although close cooperation exists between the EPA and the NHDES. In addition to the presumptive approach, the policy also allows for the demonstrative approach where levels of abatement are measured against costs using a "knee-of-the curve" analysis.

The 1994 CSO Control Policy recognized that not all CSO discharges can be eliminated or abated under all statistical conditions. The 1994 policy includes an expanded list of minimum controls and treatment requirements beginning with what are referred to as the nine minimum controls (NMC). The NMC are essentially best management practices, which include the following:

1. Proper operation and regular maintenance programs for the sewer system and the CSO points.
2. Maximum use of the collection system for storage.
3. Review and modification of pretreatment programs to assure CSO impacts are minimized.
4. Maximization of flow to the POTW for treatment.
5. Prohibition of CSO discharges during dry-weather.
6. Control of solid and floatable materials in CSO discharges.
7. Pollution prevention programs that focus on containment reduction activities.
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impact.
9. Monitoring to effectively characterize CSO impacts and the efficiency of CSO controls.

The minimum treatment requirements differ depending upon where the treatment occurs. Combined flows entering a Publicly Owned Treatment Works (POTW) must receive as a minimum primary treatment, and if required by the permitting authority, disinfection. According to the policy, the bypassing of excess combined flows around secondary treatment is allowable as long as it can be demonstrated that there is no feasible alternative. For satellite CSO treatment facilities, implementation of the NMC is considered the minimum technology-based treatment level. However, water quality impacts would dictate the actual level of treatment required for both bypasses at a POTW and for satellite treatment facilities out in the collection system.

Per the CSO Policy, communities were required to submit a report on compliance with the NMC to EPA by January 1997.

The NHDES has also issued CSO guidance documents but, in recent years, has deferred to the EPA policy.

The City of Portsmouth has fulfilled the requirements of the CSO Control Policy through both NMC development and compliance and the preparation of the 2005 LTCP, an update of the 1991 CSO Abatement Program. The City has been implementing the LTCP recommendations and will continue to do so concurrently with the preparation of the WMP in accordance with the current AO.

4. Initial Meeting with EPA and NHDES on Wastewater Master Plan Regulatory Requirements

A meeting was held at the offices of EPA in Boston on October 5, 2007, to review the regulatory framework for the WMP. Attendees included staff from the City of Portsmouth Public Works and Legal Department, engineering consultants, outside legal counsel, and representatives from EPA and NHDES (see attached agenda and attendance sheet). This was the first of what will likely be a series of meetings that will be held as the WMP tasks are preformed and additional regulatory interpretations and guidance become necessary. As shown on the agenda, a wide range of topics were discussed with some of the highlights summarized below:

a. CSO Issues

- The City will continue to implement the sewer separation program recommended in the 2005 LTCP, and as required in the 2007 AO. However, should the ongoing planning result in alternatives to this program based on improved efficiencies and/or downstream treatment conditions, EPA and NHDES would be consulted.
- In addition to floatables and bacteria being the pollutants of concern, the attainment of water quality standards will be a key regulatory concern for all CSO mitigation alternatives.
- Should the Peirce Island WWTF be converted to an intermittent-use, CSO-only treatment facility, a so-called satellite facility, the regulatory agencies would need to determine minimum treatment levels and effluent limitations, in light of water quality standards.
- When discussing the presumptive verses the demonstrative approaches as contained in the CSO Control Policy, EPA made it clear that with the latter, a simple "knee-of-the-curve" analysis may not be the final determinant as to the acceptable level of treatment. If it appears that a higher level of treatment can be attained for a small incremental cost, and if the overall cost of the program is affordable, a higher level of treatment could be required. Affordability, however, will be consideration for EPA when reviewing the recommendations.

b. Joint WWTF/CSO Issues

- CSO bypasses, also referred to as generic bypasses, will be allowed if there is "no feasible alternative". This would imply that the bypassing of the secondary treatment process would be allowed if it were not economically or technically feasible to add additional secondary capacity or otherwise reduce the flows to the WWTF in question. The minimum level of treatment for the bypass would be primary.
- Blending was discussed in the context of the approval of a bypass around the proposed secondary treatment process of a new or upgraded WWTF. NHDES has

historically required the two effluents to be combined and ultimately meet the permitted secondary effluent limitations of the WWTF as are the cases for Nashua and Manchester and possibly others. However, EPA has allowed separate effluent limitations for a number of CSO bypasses in Maine including Portland, South Portland, Bath, Augusta, Rockland, and possibly others as well. This issue as to whether blending would be required for a joint wastewater/CSO treatment facility for Portsmouth needs further discussion with NHDES as the planning continues.

c. WWTF Issues
   - General permitting requirement were discussed for a new WWTF site and centered on rules for wetland and shoreline protection, historic perseveration and others as may be applicable.
   - The issue of a new outfall, as well as continued use of the Peirce Island outfall, was also discussed in terms of the methodologies for determining dilution factors. The EPA and NHDES utilize different methodologies for modeling and interpreting rates of dilution.
   - One of the most complex problems that the City will need to address with a new upstream WWTF site is "antidegradation". According to both EPA and NHDES, the interpretation of what constitutes antidegradation has not always been clear and acceptable to all involved parties.
   - Effluent limitations for total nitrogen will be the other key issue that will affect the planning for and subsequent design of the secondary WWTF or WWTFs for Portsmouth. Because there has not been a formal Total Maximum Daily Load (TMDL) study conducted for the Piscataqua River Watershed, there is limited science-based information that can be used to regulate nitrogen loadings from the various WWTFs in both New Hampshire and Maine. There was discussion as to whether the EPA could apply a nitrogen limit for Portsmouth, and others, which might be based on factors: such as technology-based nitrogen removal levels; the limited water quality work performed in the watershed; and data from studies, including TMDLs, which were performed in Chesapeake Bay, Long Island Sound, Narragansett Bay and elsewhere. The issue also arose as to how to equate a narrative limit on nitrogen to an actual numerical effluent limitation.

No date was set for the next meeting although discussions will continue as the WMP progresses.

ATTACHMENTS
1. Agenda for October 5, 2007 Regulatory Meeting
2. Attendance Sheet for October 5, 2007 Regulatory Meeting

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