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September 20, 2019

Richard Wolff, Executive Director
North Hudson Sewerage Authority
1600 Adams Street
Hoboken, NJ 07030

Re: Review of Development & Evaluation of Alternatives Report
North Hudson Sewerage Authority – River Road Wastewater Treatment Plant
NJPDES Permit No. NJ0025321

Dear Mr. Wolff:

Thank you for the submission dated June 25, 2019 entitled: “Alternatives Development and Evaluation: River Road Wastewater Treatment Plant” as submitted to the New Jersey Department of Environmental Protection (the Department). The report was submitted in a timely manner and was prepared in accordance with Part IV.D.3.b.v of the above referenced NJPDES permit. The report is part of the development of the Long-Term Control Plan (LTCP) submittal requirements which is due on June 1, 2020.

The overall objective of the Development and Evaluation of Alternatives Report is to develop and evaluate a range of CSO control alternatives that meet the requirements of the Federal CSO Control Policy Section II.C.4, N.J.A.C. 7:14A-11, Appendix C, and the USEPA Combined Sewer Overflows Guidance for Long-Term Control Plan (EPA 832-B-95-002). Such evaluation shall include a range of CSO control alternatives for eliminating, reducing, or treating CSO discharge events. This subject report builds on other previously submitted LTCP reports referenced in Part IV.D.3.b of the NJPDES permit, which includes an approved hydrologic, hydraulic and water quality model and other information in the July 1, 2018 “System Characterization Report” (approved by the Department on May 6, 2019); the July 1, 2018 “Public Participation Process Report for the River Road Wastewater Treatment Plant” (approved by the Department on March 29, 2019); the June 30, 2018 “NJCSO Group Compliance Monitoring Program Report” (approved by the Department on March 1, 2019); and the June 2018 “Identification of Sensitive Areas Report” (approved by the Department on April 8, 2019).

As per Part IV.G.4.e.i – vii of the above referenced NJPDES permits, the Development and Evaluation of Alternatives for the LTCP shall include, but not be limited to, an evaluation of the following CSO control alternatives:

- i. Green infrastructure.
- ii. Increased storage capacity in the collection system.
- iii. Sewage Treatment Plant (STP) expansion and/or storage at the plant while maintaining compliance with all permit limits.

- iv. Inflow and Infiltration (I/I) reduction to meet the definition of non-excessive infiltration and non-excessive inflow as defined in N.J.A.C. 7:14A-1.2 in the entire collection system that conveys flows to the treatment works.
- v. Sewer separation.
- vi. Treatment of the CSO discharge.
- vii. CSO related bypass of the secondary treatment portion of the STP in accordance with N.J.A.C. 7:14A-11.12 Appendix C, II C.7.

A range of CSO Control Alternatives are covered within the report. A general overview of the information provided for the CSO control alternatives, as provided in response to Part IV.G.4.e, can be summarized below where the Department's comments follow:

- **Green Infrastructure** (GI) technologies are generally referenced in Section 5.2 (Green Infrastructure) with a detailed analysis regarding the feasibility of green (vegetated) roofs and bioretention practices including right of way (ROW) placement.
- The report identifies opportunities to **increase in-line storage capacity** in the JOSO drainage basin by either raising the regulator weirs at UC1, UC2, and WNY2 or replacing the existing side-flow weirs with bending weirs as discussed in Section 3.3.3 (Replace Existing Joint Overflow Sewer Outlet Sideflow Weirs with Bending Weirs).
- The River Road Wastewater Treatment Plant (WWTP) is operated by North Hudson Sewerage Authority (NHSA) and currently has a rated capacity of 10 MGD. In Section 6.1 (Wastewater Treatment Plant Overview), the report describes a potential upgrade to replace the secondary Settling tanks with a high rate treatment system and upsizing the chlorine disinfection tank. Four high rate treatment systems were evaluated, including ActiFLO, CoMag, Cloth Media Filtration, and Compressible Media Filtration including plant schematics as to where these treatment units would be located. The modifications will be sized to allow **expansion of the WWTP** for a dry weather flow of 20 MGD and an additional wet weather flow utilizing **CSO bypass** of 15 MGD.
- The report indicates that **Inflow and Infiltration** has an impact on CSO performance particularly with respect to increasing issues with dry weather flows at the River Road WWTP. NHSA has evaluated the River Road WWTP drainage basins using CCTV data, which indicated the severity of aging infrastructure within the service area as further described in Section 5.1 (Inflow and Infiltration).
- **Sewer separation** is the conversion of a Combined Sewer System into a system of separate storm sewers and sanitary sewers. Sewer separation is not discussed in the report with the exception of some discussion on page 4 of Appendix C (Alternatives Analysis Workshop Memorandum) in relation to the NHSA Adams Street system.
- The report describes a conceptual **storage** alternative for storage tanks to be constructed in the water near the two outfalls namely JOSO and WNY1. Another storage option is described in Section 4.3.2 (Linear Storage Tunnel at Anthony M. Defino Way) for WNY1 namely the construction of a linear storage tunnel where stored flows would then be subject to high rate treatment and disinfection.

- An analysis for disinfection **treatment** using the existing outfall pipe at the WNY1 outfall is included in Section 4.3.3.3 (Disinfect at WNY1 Solids/Floatables Facility); however, it is stated on page 4-15 that this alternative is not considered feasible since there is insufficient contact time in the pipe.

Specific Comments

Comment 1

In the Executive Summary, the report describes the procedure used for the alternatives analysis which includes preliminary screening, development of conceptual layouts, modeling, cost analysis then a weighting method to rank the alternatives as summarized in Table ES-1 (River Road WWTP Service Area – CSO Control Alternatives Comparison) with additional detail in Appendix B (Alternatives Analysis Workshop Memorandum). However, the total amount of points differs between Table ES-1 and Appendix B. Please clarify.

Comment 2

In Section 1 (Introduction), Figure 1-1 (River Road WWTP Service Area) depicts the system block diagrams of the River Road WWTP to provide an understanding of the location and configuration of the pump stations, regulators, and outfalls along the Hudson River as well as the modeled volume of the fifth-largest overflow that is used within the report as a target for storage and capacity evaluations. Please label what information is being represented for the values of 4.73 MG (million gallons) and 102 MGD (million gallons per day) for JOSO for outfalls 003A as well as for the values of 8.3 MG and 160 MGD for outfalls 001A and 002A. In addition, please describe why these values differ from those in Section 3 (JOSO Basin), Figure 3-2 (JOSO Outfall-Overflow Frequency vs. Volume, Existing Condition) and Section 4 (WNY1 Basin), Figure 4-2 (WNY1 Outfall-Overflow Frequency vs. Volume, Existing Condition).

Comment 3

In Section 1.4 (Future Conditions) it is stated that “...the year 2050 is assumed as the future baseline condition against which the alternatives have been evaluated.” The term baseline can be confusing as baseline generally means the start point of CSO control alternatives. Please use a different term for future baseline.

In Section 1.4.1.3 (New Jersey Department of Labor) there is a reference to “Error! Reference source not found.” Please correct.

Comment 4

The NJPDES permit requires that the permittee select either the Presumption or Demonstration Approach as defined in the Federal CSO Control Policy as well as in the NJPDES permit. However, as stated on page 2-1 in Section 2.1 (Alternatives Analysis Concept Workshop), “The fifth-largest overflow from the Baseline Characterization was used to estimate the facilities required to minimize overflows to an average of four per year.” The attainment of four or less overflows is an alternative defined under the Presumption Approach as is the target of 85% capture. In addition, in Table 9-1 (River Road Wet Weather % Capture) of the revised April 1, 2019 “System Characterization Report” a value of 51.8% capture is indicated. While this information is included, neither the Presumption or Demonstration Approach have been specifically selected within the report. While this comment does not necessitate a response at this time, a final selection

is required to be made in the ‘Selection and Implementation of Alternatives’ report as part of the LTCP submission due on June 1, 2020.

Comment 5

In accordance with the Federal CSO Control Policy, the assessment of system-wide CSO control alternatives is required to be based on an “average” or “typical” rainfall year. As stated within the May 2018 report entitled “Typical Hydrological Year Report”, 2004 was selected as the typical hydrological year. While a long-term precipitation data set (i.e. greater than 30 years) was considered as part of this analysis, a more recent period was used in the ultimate selection of 2004 in order to consider local climate change. While use of the year 2004 does consider climate change, please be sure to consider resiliency requirements in the design of any infrastructure (e.g., storage and satellite treatment). Specifically, in accordance with the provisions of Executive Order 11988, the USEPA and the New Jersey Water Bank require that funded infrastructure be located outside of floodplains or elevated above the 500-year flood elevation. Where such avoidance is not possible, the following hierarchy of protective measures has been established:

1. Elevation of critical infrastructure above the 500-year floodplain;
2. Flood-proofing of structures and critical infrastructure;
3. Flood-proofing of system components.

While this comment does not necessitate a response at this time, these protective measures should be a consideration in the LTCP.

Comment 6

A discussion of public participation and the CSO supplemental team was not provided in the report specific to the Development and Evaluation of Alternatives. As per Part IV.G.2 of the NJPDES CSO permit, public participation shall actively involve the affected public throughout each of the three steps of the LTCP process including the Development and Evaluation of Alternatives phase. The Department acknowledges that a listing of meetings and agendas for the CSO Supplemental Team, as well as a discussion of other public outreach, is included in your Public Participation Process Report dated June 2018. Please supplement Section 2 (Identification of the Alternatives) of this subject report with a brief summary of subsequent public participation activities as well as meeting dates specific to the development and evaluation of alternatives including a general overview of feedback on any alternatives presented that are specific to the communities served by the River Road Wastewater Treatment Plant.

Moving forward, public participation is a required element of the ‘Selection and Implementation of Alternatives’ for the LTCP. Continued public participation must be provided to garner public input regarding CSO control alternatives where a description of such activities must be included in the LTCP. The discussion should include a description of the public participation activities that occurred during the development of these reports, the feedback opportunities provided, and how feedback was considered. It is also recommended that members of the CSO Supplemental Team be provided a copy of the LTCP in advance of the June 1, 2020 due date to the Department.

Comment 7

Bending weirs have the potential to significantly reduce overflow volume at the CSO JOSO outfall and also reduce volume of influent at the River Road plant as depicted in Figure 3-14 (Change in Volume at JOSO due to Bending Weirs), Figure 3-15 (Change in Volume at River Road due to Bending Weirs), Figure 3-16

(Change in Peak Flow at JOSO due to Bending Weirs), and Figure 3-17 (Change in Peak Flow at River Road due to Bending Weirs). Costs have been provided in Table 3-5 (JOSO Proposed Bending Weirs Conceptual Cost Estimate) and based on Section 3.4 (JOSO Basin Alternatives Comparison), bending weirs do receive a relatively high weighted score particularly in comparison to other CSO alternatives as shown in Table ES-1 (River Road WWTP Service Area – CSO Control Alternatives Comparison). However, in Section 3.3.2.2.(Network Updates) it is stated that the weir height of the regulators UC1, UC2 and WNY2 would need to be raised by 4 feet. Please explain if this is feasible and how any projected additional street flooding could be prevented.

Regarding Table 3-4 (Summary of Modelling Results), Total CSO Volume (MG) at JOSO (003A) is 95 MG under existing conditions and 28 MG with bending weirs. However, total CSO Volume (MG) at River Road (002A) is 190 MG under existing conditions and 254 MG with bending weirs. It appears that additional flow will be diverted to River Road Plant. Please clarify if this is the case and if so, please address the scenario in Section 6 (River Road Wastewater Treatment Plant).

Comment 8

In Section 3.3 (Alternatives) there are subsections to describe the alternatives for the JOSO Basin that moved on from Preliminary screening for further evaluation. This includes two types of changes to the regulator weirs, and construction of a storage tank as described below in comment 9. Please provide additional information in this section why disinfection was not selected for the JOSO basin for further evaluation for the purposes of report completeness.

Section 4.3.3 is entitled “Disinfect at WNY1 Solids/Floatables Facility” which implies that this alternative does not include pretreatment prior to disinfection. Please clarify the intentions for settleable solids removal and primary clarification.

Section 4.3.2 (Linear Storage Tunnel at Anthony M. Defino Way) for WNY1 describes the construction of a linear storage tunnel where stored flows would then be subject to high rate treatment and disinfection. Section 4.3.4 (WNY1 Outfall Cloth Media Filtration Facility) and 4.3.5 (WNY1 Outfall Compressible Media Filtration Facility) do discuss pretreatment technologies for WNY1; however, in the Executive Summary Table ES-1 there are no scores as a weighted point total or as a weighted percent for Cloth Media Filtration and Compressible Media Filtration. Similarly, in Section 4.4 (WNY1 Basin Alternatives Comparison) pretreatment technologies are not identified and there are no scores as a weighted point total or as a weighted percent. Please provide this information.

Comment 9

Storage alternatives are described in Section 3.3.1 (Combined Sewer Overflow Storage Structure in Water and Divert Flow to Adams Street Wastewater Treatment Plant) as well as in Section 4.3.1 (Combined Sewer Overflow Storage Tank Near WNY1 Outfall). For both alternatives the concept of a storage tank constructed in the Hudson River which could include a public/private partnership with a residential development. The target volume for JOSO would be 4.7 million gallons (MG) with an approximate area of 63,000 square feet whereas the target volume for WNY1 would be 8.3 MG with an approximate area of 37,000 square feet.

As described within these sections these alternatives are technologically challenging, there are also significant regulatory requirements for these alternatives and feasibility is unclear. Please provide additional information as to whether or not available land options have been fully exhausted. Additional discussion needs to be included to explain if there is any land available for storage and if any such properties

could sustain the needed tank sizes referenced in this section. In addition, please describe whether or not any potential storage tanks would be surface or subsurface and, if subsurface, whether or not consideration has been given to any amenities such as parks, parking or GI.

Considering this alternative for JOSO, for any stored flows which would be pumped to the Adams Street Wastewater Treatment Plant, please explain if there is available capacity to accept such flows. In addition, because the storage volume of the tank cannot contain the fifth largest storm, please clarify if any extraneous flows that the tank cannot hold can be diverted to the Adams Street WWTP. Please clarify why these flows could not be conveyed to the River Road WWTP.

Comment 10

Section 5 (Systemwide Alternatives) includes a discussion of I/I in Section 5.1 (Inflow and Infiltration). Table 5-1 (River Road Service Area-Estimated I/I to Be Removed by Drainage Basin) depicts the estimated I/I to be removed based on the collection of CCTV data and analysis for each pipe based on the Pipeline Assessment Certification Program rating scale. However, in Table 5-1 the results are unclear given that the last two columns have the same title but represent different figures. Please clarify.

Comment 11

Section 5 (Systemwide Alternatives) includes a discussion of I/I as well as GI as referenced previously. However, there is no specific discussion in the report regarding sewer separation for the River Road sewer service area as to relates to sewer separation. Please provide additional site-specific discussion in this section in order to provide a more complete evaluation of the sewer separation alternative.

Comment 12

In Section 5.2 (Green Infrastructure) different types of GI are described where an analysis is included regarding the feasibility of bioretention practices and green (vegetated) roofs. It is stated in Section 5.2.1.2 (Functionality and Feasibility) that a number of right of way (ROW) GI implementation assumptions are considered such as drainage area, GI storage volume and GI siting. Regarding assumptions for the drainage area, the 2013 Hoboken Green Infrastructure Strategic Plan is cited even though Hoboken is not within the River Road sewer service area. Please justify why use of this plan is appropriate for this analysis.

Table 5-5 (Estimated Maximum ROW GI Storage Volume by Drainage Basin in Authority Service Area) depicts the estimated GI storage volume by drainage area where a total of 4.6 million gallons is identified. The Department acknowledges the inclusion of this quantitative metric for GI which is needed in order to establish that any volumetric credit is given towards overall CSO reduction goals and changes from the baseline. Additional feasibility analysis is described in Section 5.2.1.2 (Functionality and Feasibility) where a value of 4.6% is identified for feasible road area (Table 5-6 (GI Area and Feasible Roadway Area in the Authority Service Area). A value of 5% as an implementation percentage of rooftops is assumed to be available for green roofs as indicated in Table 5-7 (Private Rooftop Storage in the Authority Service Area). It is then concluded on page 5-5 that “Green infrastructure can reach 35% of the goal for volume reduction in the River Road WWTP service area.”

While the Department acknowledges that a robust analysis is provided in the report on the possibilities for volume reduction through GI, there is limited information regarding the siting of potential GI projects. Please supplement the report with additional information regarding potential sites for GI locations to demonstrate whether or not the goal of 35% is viable. For example, this could include a map of sites for potential ROW GI storage sites. In addition, please describe how operation and maintenance can be assured for publicly and privately-owned GI ROW sites and/or green (vegetated) roofs.

Comment 13

The Department is in receipt of a September 6, 2019 letter from Fredric J. Pocci, Engineer of North Hudson Sewerage Authority, requesting an increase of flow with full treatment to 15 MGD. However, the DEAR indicates that the River Road WWTP will increase their flow with full treatment to 20 MGD. Please clarify this discrepancy.

Comment 14

While cost analyses are provided within the report within Section 3 (JOSO Basin), Section 4 (WNY1 Basin), Section 5 (Systemwide Alternatives) and Section 6 (River Road Wastewater Treatment Plant) for each analyzed alternative, please note that the Department is not commenting on any cost analysis at this time and will defer its comments until the LTCP submission. This includes any conclusions regarding the selection of any preliminary CSO control alternatives, present value calculations, and the cost range of any CSO control alternatives.

Please incorporate these changes to the report and submit a revised version to the Department no later than 60 days from the date of this letter. Thank you for your continued cooperation.

Sincerely,



Joseph Mannick
CSO Team Leader
Bureau of Surface Water Permitting

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