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CATHERINE R. McCABE
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September 25, 2019

Richard Haytas, Senior Engineer
Jersey City Municipal Utilities Authority
555 Route 440
Jersey City, NJ 07305

Re: Review of Development and Evaluation of Alternatives Report
Jersey City Municipal Utilities Authority, NJPDES Permit No. NJ0108723

Dear Mr. Haytas:

Thank you for your submission of the "Development and Evaluation of Alternatives for Long Term Control Planning for Combined Sewer Systems – Regional Report" dated July 1, 2019 as submitted to the New Jersey Department of Environmental Protection (the Department or NJDEP) which contains the "Development and Evaluation of Alternatives Report" (hereafter "the report") for Jersey City MUA. The regional report was submitted in a timely manner and was prepared in response to Part IV.D.3.v of the above referenced NJPDES permit. The regional report is part of the development of the Long-Term Control Plan (LTCP) submittal requirements, of which the next deliverable is due on June 1, 2020.

The "Development and Evaluation of Alternatives for Long Term Control Planning for Combined Sewer Systems – Regional Report" includes individual DEARs developed by PVSC and each of its 8 member combined sewer municipalities as Appendices, where Appendix E is specific to the Jersey City. This subject letter serves to provide a response to the "Development and Evaluation of Alternatives Report" specific to Jersey City (Appendix E) where a response to the overall regional report is provided under separate cover.

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 June 2018 "System Characterization Report" (approved by the Department on April 12, 2019); the June 2018 "Public Participation Process Report" (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.

The Department finds that the report includes an analysis of a range of CSO control alternatives as identified in the NJPDES permit as well as inclusion of several control programs. 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) is evaluated, among other possible source reduction technologies available to Jersey City. The selection criteria for GI technologies focused on the ability to retain at least one inch of rain, design flexibility, and visual appeal. The GI technologies that were chosen for further evaluation are roadside rain gardens, bioswales, and tree pits.

- In Section C.4 (Sewer System Optimization), the report describes the **Sewer System Optimization** program implemented by the City to repair and optimize the storage capacity of the Jersey City collection system. This work was started as a result of the "JCMUA CSO Correction Project, 1999" and addressed regulator modifications (raise weir elevations) and the installation and repair of tide gates. Page 7 of the Report states that "further raising the weir elevations would exacerbate street flooding." JCMUA has chosen not to further consider inline storage as a CSO control technology.

- JCMUA evaluated both tanks and tunnels as **offline storage** alternatives. JCMUA analyzed the possibility of an east and west side tunnel which would be connected by drop shafts to the east and west side outfalls in the City, as stated on page 8 of the Report. As described in Section D.1.5.5 (Performance for Off-line Storage with Tunnels), tunnels were sized for 4, 8, 12, and 20 CSO overflows and 85 percent capture, based on existing east and west side pump station capacities. Each tunnel would be approximately 27,000 feet in length with diameters of the tunnels ranging from 6.5 feet to 12 feet. Section D.3.3 of the Report lists the following possible alternatives for offline storage: storage tanks/treatment shafts for the W1 and W2 subdrainage areas, if necessary, additional storage tanks for W3 to W13 subdrainage areas, addition of storage tanks at E18 and E19 subdrainage areas, or solely a tunnel on the west side alone if storage tanks are deemed less favorable.

- In Section C.6. of the Report, JCMUA evaluated two options of **STP expansion:** either upgrading the East and West Side Pump Stations while using the existing 6 ft diameter force main or upgrading the pump stations and constructing a new 12,000 linear foot, 9 foot diameter force main.

The report explains that reduction of CSOs through STP expansion is limited by the capacity of the interceptors that convey flow to the east and west side pump stations. However, increasing the capacity of the east and west side pump station in combination with other technologies will be evaluated further.

- Jersey City has ongoing operations to reduce excessive **infiltration and inflow** (I/I). As described in Section D.1.1.1, approximately 67% of the sewer pipes (6,926 pipe segments) in Jersey City were inspected to identify defects. Based on the inspection, 87,896 feet (805 pipe segments) need to be replaced or rehabilitated as shown in Figure D.1-1. Table D.1-1 shows the implementation of I/I for each subdrainage area. This report concludes that 0.88 MGD of total flow rate can be eliminated through I/I pipe replacement or rehabilitation.

- The report discusses the current **sewer separation** projects in Jersey City, as well as plans for future projects. Jersey City has undertaken sewer separation in Washington and Essex Streets. Additional sewer separation is recommended in the Bates Street Redevelopment Area to alleviate combined sewage flooding, as explained in Section D.1.1.2 of the Report. Appendix B contains the design drawing for this sewer separation project.

- The report includes an evaluation of the following **CSO treatment** technologies: screening, pretreatment, and disinfection. Jersey City evaluated several disinfection technologies including chlorine dioxide, sodium hypochlorite, and peracetic acid (PAA). Since the efficiency of disinfection is improved by reducing the total suspended solids concentration, the treatment process requires screening and pretreatment. On page 10 of the Report, it is concluded that this alternative was not given further consideration due to the high costs of treatment and disinfection.

Specific Comments

Comment 1

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 2

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. Throughout the Report and particularly in Section D.3.2 (Regulatory Compliance) the attainment of 85% percent capture as an alternative under the Presumption Approach is described as is the Demonstration Approach for certain outfalls. However, 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.

Baseline percent capture is discussed throughout the report in multiple sections such as in Section D.1.5 (Performance Considerations) where a value of "…72.4% for the baseline scenario" is identified. For report completeness the percent capture equation utilized to calculate any baseline and other percent capture values for each hydraulically connected system must be provided. Specifically, the permittee shall provide the percent capture equation utilized to calculate any baseline and other percent capture values for each hydraulically connected system.

Comment 3

The Department acknowledges that hydraulically connected system is defined within the notes and definitions in Part IV of the NJPDES permit as "The entire collection system that conveys flows to one Sewage Treatment Plan (STP)…" The definition of hydraulically connected system allows the permittee to "segment a larger hydraulically connected system into a series of smaller inter-connected systems." If it is your intention to define a hydraulically connected system together with the other municipalities that convey flow through the Hudson County Force Main, a justification for the segmentation of those communities that pump to the Hudson County Force Main must be provided. See also **Comment 2** above regarding the evaluation of percent capture.

Comment 4

In Section C.2.1 (Green Infrastructure), Section D.1.1.3 (Siting for Green Infrastructure Source Controls), Green Infrastructure is discussed. Section D.1.1.3 of the Report states that, based on boring data, there are 297 acres of Jersey City that are optimal sites for GI. This equates to 7% of the City's impervious area as shown in Figure D.1-2. Less optimal locations are available that can increase GI to 10% of impervious area, which are presented in Figure D.1-3.

As GI implementation continues to be assessed any percentage must be equated to a reduction in CSO volume, frequency and duration in order to attain these targets and show any changes from the baseline. The inclusion of this quantitative metric for GI is needed in order to establish that any volumetric credit is given towards overall CSO reduction goals. Please describe how you derived the acreage values referenced in order to quantify the volumetric decrease in CSO flow from GI measures.

Comment 5

There is limited discussion within the report in Section C.6 (STP Expansion or Storage at the Plant) with some additional discussion in Section D.1.1.4 (Siting for Maximizing Flow to the POTW) regarding the required evaluation of the alternatives concerning STP Expansion and CSO-related bypass. The Department acknowledges that JCMUA does not own/operate the PVSC treatment plant; however, documentation of coordination between the two parties is essential in order to evaluate whether or not this is a viable alternative. In addition, additional documentation regarding coordination with the other

communities that share the force main is needed. For example, please identify the current conveyance capacity of the force main, as well as if there is adequate conveyance capacity to divert additional CSO flow to PVSC. Has there been discussion with PVSC about the acceptance of these flows? Please clarify.

Comment 6

Storage is discussed in Section C.5 (Storage) and in Section D (Alternatives Analysis). Siting information has been included for tunnels and in Figure D.1-4 (Proposed Jersey City Tunnel Alignment) and grouped storage tanks in Figure D.1-5 (Grouped Storage Tank Locations). The preliminary locations for the nine grouped storage tanks are shown in Figure D.1-5. Page 19 of the Report states that this alternative would require seven miles of new combined sewer pipes to connect the existing outfalls. Please supplement this section with additional discussion as to whether or not these areas could sustain the needed volume of the estimated tank sizes. If storage is being considered at any available properties near the outfalls, please describe whether any potential storage tanks would be surface or subsurface and, if subsurface, whether consideration has been given to any amenities such as parks, parking lots or GI. In addition, please confirm as to whether or not this stored flow would be sent PVSC, whether PVSC could accept stored tank flow, or if there are any conveyance limitations that would prevent such.

Comment 7

A discussion of public participation and the CSO supplemental team was not provided in the report specific to the Development and Evaluation of Alternatives; however, some discussion of public acceptance is included as Section D.1.4 (Public Acceptance) as broken down for each preliminary alternative. 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 D.1.4 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 Jersey City.

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 8

In Section D.3.2 (Regulatory Compliance), Jersey City has stated on pages 29 and 30 that the demonstration approach may be utilized for the waterbodies they claim are meeting water quality criteria for fecal coliform and Enterococci. For the outfalls that discharge to Penhorn Creek, the presumptive approach with the target goal of 20 overflows may be proposed since this would result in a percent capture of 93% during the 2004 typical year. It is premature and outside of the scope of this report to include this conclusion regarding compliance with water quality standards. Please revise this statement as well as other similar statements within the report.

Comment 9

Section D.1 includes a discussion of the seven control program alternatives with individual subsections for each including siting, implementability, public acceptance and performance. In addition, a summary rating with weighted scores is provided as Table D.2-1 (Alternatives Evaluation Matrix) along with additional discussion in Section D.3.

Generally, these alternatives show a singular approach through the implementation of one alternative as opposed to a mix of various alternatives. Please expand on whether or not a mixed approach has been considered to address each outfall.

Comment 10

While cost analyses are provided within the report, particularly in Section D.3 (Summary of Cost Opinions), 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 of the regional report to the Department no later than 60 days from the date of this letter. Thank you for your continued cooperation.

Sincerely,

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CSO Team Leader
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