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September 19, 2019

Stephen Dowhan, Superintendent
Joint Meeting of Essex &Union Counties
500 South First Street
Elizabeth, NJ 07202

Daniel J. Loomis, City Engineer
Department of Public Works
Office of City Engineer
50 Winfield Scott Plaza
Elizabeth, NJ 07201-2462

Re: Review of Development & Evaluation of Alternatives Report
City of Elizabeth, NJPDES Permit No. NJ0108782
Joint Meeting of Essex &Union Counties (JMEUC), NJPDES Permit No. NJ0024741

Dear Permittees:

Thank you for your submission to the New Jersey Department of Environmental Protection (the Department or NJDEP) dated June 28, 2019 which contains the "Development and Evaluation of Alternatives Report" (hereafter "the report"). This report was submitted in a timely manner and was prepared in response to Part IV.D.3.v of the above referenced NJPDES permits. The 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 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 January 17, 2019); the June 2018 "Public Participation Process Report" (approved by the Department on February 7, 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).

This subject letter serves to provide a response to the Development and Evaluation of Alternatives Report.

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 a range of CSO control alternatives as identified in the NJPDES permit. 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:

- As discussed in Section 7.6 (Control Program 6: Green Infrastructure), JMEUC and Elizabeth City evaluated 2.5%, 5%, 7.5%, 10%, and 15% of the impervious area within the combined sewer area for **green stormwater infrastructure**. The report states that GI has a minimal impact on overflow volume reduction. Many figures in Section 7.6.2 were included in this report regarding possible locations for GI implementation. This includes soil infiltration potential, percentage of impervious cover and typical street segments for green stormwater infrastructure. It was determined that the maximum amount of impervious area within the City that could practically be directed to green stormwater infrastructure was approximately 2.6%. The report also states that an estimation of 5% of the directly connected impervious area is the upper bound of what could reasonably be directed to GI.

- A **deep tunnel storage** control program of approximately 19,800 feet of tunnel to service 26 outfalls was evaluated in the report. This alternative also incorporates satellite storage for CSO Basins 001 and 002, and sewer separation for Basin 037. Page 7-61 includes a conceptual layout for the tunnel layout, in two segments (east and west tunnels). As stated on page 9-7 of the report, a centralized storage tunnel is also beneficial, as compared to satellite storage facilities, because it serves to store overflows from outfalls throughout the City during wet weather events. As described on page 7-63, the sizing of the tunnels is based on increased CSO conveyance and treatment, with the pumping capacity at the existing TAPS upgraded to 65 MGD. The sizing of the tunnels would need to be reevaluated if further changes in capacity to TAPS, the JMEUC trunk sewers, and/or the WWTF are chosen as CSO control alternatives.

- The report evaluates the siting of **storage** facilities near the **point of discharge** for each CSO outfall, or group of outfalls. Pages 7-52 and 7-53 of the report show examples of storage tank layouts. As noted for storage facilities, the storage tanks for grouped outfalls would need to be sized for the peak flow rate. The report explains that extensive land acquisition will be necessary for storage facilities and there are constraints on finding sufficient suitable sites for these facilities. However, as stated on page 9-6, the satellite storage facilities costs compare more favorably to the other control alternatives at the higher CSO frequency metrics. As discussed on page 7-48, the sizing of these satellite storage facilities is based on increased CSO conveyance and treatment, with the pumping capacity at the TAPS upgraded to 65 MGD. Sizing of storage would need to be

reevaluated if further changes in capacity to TAPS, the JMEUC trunk sewers, and/or the WWTF are chosen as CSO control alternatives.

- The report evaluates the siting of a **CSO treatment facility** near the point of discharge for each CSO outfall, or group of outfalls. Figure 7-1 (Satellite CSO Treatment Typical Site Plan) on page 7-9 of the report displays a typical site plan for a satellite CSO treatment train. Preliminary sizing of satellite treatment facilities was determined considering primary treatment using the Actiflo® process and peracetic acid disinfection. As noted for storage facilities, the treatment units for grouped outfalls would need to be sized for the peak flow rate. The report includes an extensive preliminary siting analysis in Section 6 (Evaluation Criteria and Performance Considerations) which includes a map of non-residential land use in the City of Elizabeth and an evaluation of over 80 sites by ranking in order of favorability on a scale of "very low" to "good." Of these 80 sites, only 11 were deemed "good" or "favorable." The report concludes in Section 9.2 that satellite treatment may not be a desirable alternative due to the cost of land acquisition and challenges of permitting; access to and maintenance of these facilities; and staffing resources required for operations.

- Regarding **STP expansion and/or storage at the plant** and **CSO related bypass,** JMEUC and the City of Elizabeth evaluated the level of CSO control that can be achieved by expansion of the City's combined sewage pumping and conveyance capacity to deliver flow to the JMEUC WWTF for treatment of additional wet weather CSO from the City of Elizabeth. This control program was described in two plans:

    1. Initially, a plan for increased CSO treatment to improve system-wide capture by increasing the TAPS pump rate from 36 to 55 MGD would require a change in the contractual agreement with JMEUC as well as moderate improvements to the TAPS.
    2. Ultimately, the plan would include further increasing the pump capacity of TAPS and new wet-weather treatment through a CSO related bypass. Any bypassed flow would be treated for solids removal and disinfection (i.e., chlorination and dechlorination), and combined with the WWTF effluent.

- Regarding **I/I reduction**, the report includes a detailed discussion, analysis, and comparison of JMEUC's I/I practices on a national basis to demonstrate the success of their program. As described in Section 7.7.1 (JMEUC's Existing I/I Reduction Program), "…an estimated 40% of infiltration and 34% of inflow have been removed from upstream member municipalities since 1983." While Section 9.2 (Review of Evaluation Findings) of the report states that I/I reduction will not be included in the LTCP as a specific CSO control approach, JMEUC will continue its current program to encourage its member and customer communities to implement I/I reduction as part of ongoing sewer system management practices.

- Regarding **sewer separation**, the report describes in Section 7.1 (Control Program 1: Complete Sewer Separation) on page 7-3 that sewer separation has been implemented in various parts of the City of Elizabeth. Regarding complete sewer separation, the report concludes in Section 9.2 (Review of Evaluation Findings) that implementing this alternative as a system-wide alternative across the entire City would be disruptive and costly and would increase untreated stormwater

discharges. However, JMEUC and the City of Elizabeth are considering partial separation in remote areas, such as the basin draining to DSN 037A (as part of Control Program 5: Tunnel Storage and Secondary Controls, beginning on page 7-60) or as an additive to other control programs.

Specific Comments

Comment 1

On page 1-1, the report states, "This report documents the process used to develop alternatives and demonstrates that a full range of potential controls with respect to meeting pertinent water quality standards have been analyzed." However, the federal and state regulations, and the NJPDES permit states that "The permittee shall submit, as per Section D.3.b.v, the Evaluation of Alternatives Report that will enable the permittee, in consultation with the Department, the public, owners and/or operators of the entire collection system that conveys flows to the treatment works, to select the alternatives to ensure the CSO controls will meet the **water quality-based requirements of the CWA**, will be protective of the existing and designated uses in accordance with N.J.A.C. 7:9B, give the highest priority to controlling CSOs to sensitive areas, and address minimizing impacts from SIU discharges." (emphasis added)

Regarding compliance with water quality standards, it would be premature and outside the scope of this report to draw any conclusions regarding compliance with water quality standards given that ambient water quality modeling results have not yet been submitted. Please revise the language in the report to reflect that the CSO control alternatives will be evaluated to meet the "water quality-based requirements of the CWA."

Comment 2

In Section 3 (CSO Receiving Waters and Control Objectives), page 3-1 of the report states,

> "The standards are based on both bacterial and physical/chemical standards such as levels of dissolved oxygen, turbidity, nutrients, and pH. Discharges from combined sewer overflows contribute pathogens, and thus the parameter of interest for CSOs is the bacterial standards."

Similarly, it is stated on page 3-3 that pathogens are the pollutant of concern and similar references are included on other pages. While the Department agrees that pathogens are intended to serve as an indicator parameter for CSOs, please note that the CSO Control Policy requires controls adequate to meet the water quality based requirements of the Clean Water Act. While this comment does not necessitate a response at this time, the Department hereby notes this information for the Administrative Record.

Comment 3

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. These alternatives are briefly discussed in Section 3.2 (CSO Control Objectives), where it is stated that a final selection of the CSO control approach will be made in the subsequent report, namely the "Selection and Implementation of the LTCP." 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. Note that if the Presumption Approach is selected, the percent capture equation utilized to calculate any baseline and other percent capture values for each hydraulically connected system must be included for report completeness.

Comment 4

Section 3.4.2 (Percent Capture Calculations) includes a summary of the Presumption Approach as included in the Federal CSO Control Policy, along with this excerpt on page 3-8:

> "The percent capture was calculated using two different approaches: the first is percent capture at the inflow of the Trenton Avenue Pump Station, and the second is percent capture at the inflow of the Joint Meeting WWTF…"

In order to evaluate percent capture under the Presumption Approach, the percent capture equation utilized to calculate any baseline and other percent capture values for each hydraulically connected system must be included for report completeness. Specifically, please provide the equation that was utilized to derive the values in Table 3-6 (Percent Capture for Range of Control Levels).

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

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. A robust discussion of public participation and the CSO supplemental team is included in Section 8 (Public Participation Process Update). This discussion includes detailed information about meeting notes; a summary of community outreach and educational activities; signage; and notification systems.

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 – Additional Questions

Section 7.2 (Control Program 2: Satellite CSO Treatment Facilities) on page 7-8 concerns siting of treatment facilities near the point of discharge for each CSO outfall or group of nearby outfalls. However, in the event there are increases in capacity to TAPS, JMEUC trunk sewers or the WWTF, this could change the siting, location, and costs for satellite treatment. Please consider this factor when a combination of control programs is determined. While this comment does not necessitate a response at this time, the Department hereby notes this information for the Administrative Record.

Comment 8

Beginning on page 7-37 within Section 7.3.5.3 (Disinfection Options) the report includes discussion regarding reduced chlorine contact times at the WWTF. Please note that the issue of current chlorination practices at the WWTF are outside the scope of this report and disinfection practices as part of any proposed bypass will be evaluated as part of any proposal consistent with N.J.A.C. 7:14A-23.

Comment 9

On page 7-23 of the report, Table 7-15 (Existing Average Influent and Effluent Data) includes a value of 92.6 mg/L as the average WWTF effluent TSS strength from 2013 through 2018. This value seems to be in error since the final effluent limitation for TSS is 30 mg/L and this value is not consistent with the data reported by JMEUC in Table 7-18 (TSS and cBOD Summary), which includes a value of 13.0 for the same parameter. The ammonia and COD values also seem rather inconsistent between this table and those presented for the same time period for Existing Average Wet Weather Influent and Effluent Data in Table 7-17 (Existing Average Wet Weather Influent and Effluent Data). Additionally, the values listed on page 7-36 are different still, referencing values of 13.9 mg/L for TSS and 22.4 mg/L cBOD for average wet weather effluent values. Please verify and correct as appropriate.

Comment 10

Section 7.3 (Control Program 3: Pump Station and Treatment Plant Expansion) includes significant detail about maximizing wet weather flows to JMEUC through various measures to optimize TAPS. Based on the information provided in the report, this project appears to be cost effective and could be implemented in the short term. As depicted on page 7-41 in Table 7-22 (Control Program 3A – Increased CSO Treatment with 55 MGD Conveyance Real Time Control, Performance Summary) the changes at each outfall are described in terms of volume, duration, and number of events for Control Program 3A. Please update the Department regarding this project in the quarterly progress reports and feel free to contact your team leader if questions or concerns arise.

Comment 11

As stated in Section 9.3 (Direction for the Selection and Implementation of Alternatives Report) on page 9-8, "In this next step, both standalone programs and combinations of different programs will be considered based on feasibility, site suitability, cost, percent capture and other considerations." The Department commends the thorough analysis that was completed for each separate control program. Generally, these alternatives show a singular approach in combination with additional pumping at TAPS from 36 to 55 MGD as opposed to a more complete mix of various alternatives. However, as noted in this excerpt, the Department understands that a thorough combination of the different control alternatives will be evaluated as part of the final Selection and Implementation of the LTCP. While this comment does not necessitate a response at this time, the Department hereby notes this information for the Administrative Record.

Comment 12

Cost analyses and cost summaries are provided and referenced throughout the report particularly within Section 7 as part of each Control Program. However, please note that the Department is not commenting on this analysis at this time and will defer its comments as part of 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.

Comment 13

Please provide clarification or updated figures/diagrams for the following sections:

- Figure 1-1, 2-1, 2-2, 2-3, 2-4, 3-1 and 3-2 have poor resolution in the report. Please correct by providing maps in place of these figures.

- Table 3-4 (Typical Year Existing Conditions Annual Total CSO Characterization by Outfall) is useful to frame the preliminary alternatives discussed throughout the report. It would be useful if a similar table could be provided with the same information, but the rows reorganized with the outfalls either ranked by highest CSO volume or color coded to illustrate highest volumes or events etc.

- Table 7-2 (Control Program 1 – Sewer Separation, Performance Summary) is useful to frame the preliminary alternatives discussed within the report. Please provide these tables with the rows reorganized with the outfalls either ranked by highest CSO volume or color coded to illustrate highest volumes or events etc.

- Regarding Table 4-4 (Additional Base Sanitary Flow by CSO Drainage Basin for Future Conditions), please expand on this table to show the existing Base Sanitary Flow and any percent increase in BSF to illustrate the increased populations effects for comparison purposes.

- Page 7-22 of the report states, "…At the dewatering facility, digested sludge is dewatered by centrifuge, lime is added for stabilization, and Class A stabilized product is hauled offsite for land application." Please clarify where the sludge (biosolids) is being land applied since JMEUC does not have an Individual Permit for Land Application of Biosolids in New Jersey.

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,

Nancy L. Kempel

Nancy Kempel
CSO Team Leader
Bureau of Non-Point Pollution Control

C: via email Samual McGhee, Executive Director, JMEUC
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