



State of New Jersey

PHIL MURPHY
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Mail Code – 401-02B

CATHERINE R. McCABE
Commissioner

SHEILA OLIVER
Lt. Governor

Water Pollution Management Element
Bureau of Surface Water Permitting
P.O. Box 420 – 401 E State St
Trenton, NJ 08625-0420
Phone: (609) 292-4860 / Fax: (609) 984-7938

September 25, 2019

Kareem Adeem, Assistant Director of Public Works
City of Newark
239 Central Avenue
Newark, NJ 07102

Re: Review of Development and Evaluation of Alternatives Report
City of Newark, NJPDES Permit No. NJ0108758

Dear Mr. Adeem:

Thank you for your submission of the “Development and Evaluation of Alternatives for Long Term Control Planning for Combined Sewer Systems – Regional Report” dated June 21, 2019 as submitted to the New Jersey Department of Environmental Protection (the Department or NJDEP) which contains the “Development and Evaluation of CSO Alternatives Report” (hereafter “the report”) for the City of Newark. 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 G is specific to the City of Newark. This subject letter serves to provide a response to the “Development and Evaluation of Alternatives Report” specific to the City of Newark (Appendix G) 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) technologies are described in Section C.2.1 (Green Infrastructure) and states on page 7 “Evaluation of potential GI opportunities will be further refined in the next steps of the alternative evaluation.” Section D.2.2 (Green Infrastructure) also includes a description of the ancillary environmental, social and economic benefits of GI to the community.
- Regarding **increased storage capacity in the collection system**, the report evaluated sewer system optimization in Section C.4 (Sewer System Optimization) including regulator modifications, conveyance, and real time control. Specific information is included in Section D.2.1 (Alternative 1 – Regulator Modification/Flow Maximization) where model simulations were conducted for 3 regulator modifications and CSO volume reduction results ranged from 0.7% to 5.3%. as shown in Table D-2 (Overflow Volumes and Frequencies with Regulator Modifications).

As discussed in Section C.5 (Storage), various **storage** technologies were evaluated including pipeline storage, tunnel storage and tank storage. Section D.2.3 (Alternative 3 – CSO Storage) focuses on the storage tank option where it is stated on page 32 that “...an iterative approach was used to estimate the volume required for 0, 4, 8, 12 and 20 overflows” and results are displayed in Table D-5 (Total CSO Storage Volumes and Reductions for 0, 4, 8, 12, and 20 Overflows). It is also stated on page 22 that “It is assumed that a storage tank would be located near the existing outfall and it would be below the ground.”

- **STP Expansion** is discussed in Section C.6 (STP Expansion or Storage) where it is explained on page 9 that “PVSC owns and operates the wastewater treatment plant that receives and treats flows from Newark.” It is then further stated that “Any modifications to the treatment plant that would result in CSO volume and frequency reduction, or any increased treatment capacity, will be addressed by PVSC and its consultants.”

- **Inflow and infiltration (I/I) reduction** is described in Section C.3 (Infiltration and Inflow Control) as well as in Section D.2.4 (Alternative 4 – Inflow and Infiltration Reduction). As stated on page 34, “The City of Newark has conducted sewer upgrade projects, including the lining of the brick sewers, and is expected to continue to upgrade the sewer system. This will control infiltration/inflow; however, these types of projects on their own will not attain the performance objectives...” Please refer to **Comment 7** below for additional information regarding inflow.
- **Sewer separation** is described in Section C.7 (Sewer Separation), in Section D.2.7 (Alternative 7 – Sewer Separation), and sewer separation areas are depicted in Table D-9 (City of Newark Sewer Separation Land Use Area by Ward). On page 40 it is concluded that “A sewer separation alternative may be investigated further if added benefits such as flood reduction or redevelopment in the areas warrants it.”
- The report evaluates **satellite treatment** (i.e., treatment of the CSO discharge) namely PAA Disinfection in Section D.2.6 (Alternative 6 – Satellite Treatment). Frequency reduction and volume reduction are evaluated against the frequency targets of 0, 4, 8, 12, and 20 overflow events per year as shown in Table D-6 (Impacts of Disinfection for Range of CSO-Control Objectives).

Specific Comments

Comment 1

Some discussion of public participation and the CSO supplemental team is included in Section D.1.4 (Public Acceptance). 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 list 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 amend 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 the City of Newark. The Department notes that Newark DIG (Doing Infrastructure Green) (<https://www.newarkdig.org/about>) is a community group that meets on a routine basis where outreach and education on CSOs is one of their primary goals. It is suggested that summaries of these meetings be incorporated into the report.

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 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. Performance considerations are discussed in Section D.1.5 (Performance Considerations) where the frequency of CSO events and 85 percent capture is described within this section and in other sections of the report. The attainment of percent

capture or 4 overflows or less are two of the alternatives for the Presumption Approach. While this information is included, neither the Presumption of 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. 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 3

The following excerpt is included in Section D.1.5 (Performance Considerations) on page 21:

“PVSC has indicated (2019, G&H) that for Newark, a 7% reduction of CSO volume (that is, a CSO discharge of no more than 93 MG) is required to achieve the 85% capture target.”

As noted above, Section D.1.5 includes a reference to a memorandum “(2019, G&H).” Please provide a copy of the memorandum and specifically the percent capture equation utilized to calculate any baseline and other percent capture values for each hydraulically connected system.

In addition, 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.” Please provide a justification for the segmentation of Newark as a hydraulically connected system for report completeness. See also **Comment 2** above regarding the evaluation of percent capture.

Comment 4

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 5

In Section D.2.2 (Alternative 2 – Green Infrastructure (GI)) the use of GI is described and there is a reference on page 7 within Section C.2.1 to the “Green Infrastructure Feasibility Study, Newark,” as

prepared by Rutgers University as well as a reference on page 28 within Section D.2.2 to the “Impervious Cover Reductions Action Plan for Newark, Essex County NJ” also prepared by Rutgers University. Section D.2.2 states that three different control levels of GI were assessed. The first alternative involves the implementation of GI identified in the latter Rutgers study; the second level includes “applying bio-detention modeling that detail and infiltrates runoff generated from 5% of the impervious surfaces in Newark; whereas the third level includes the “application on 10% of the impervious surfaces in Newark”. All three alternatives are equated to the number of necessary acres on page 27 to attain these targets and the CSO volume and frequency changes from the baseline are depicted in Figure D.2-7 and Figure D.2-8, respectively. 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. Please describe how you obtained the acreage values referenced in order to quantify the volumetric decrease in CSO flow from GI measures.

However, the report contains limited information regarding the siting of potential GI projects. Beyond the reference to available city owned site in Section D.1.1 (Siting) as well as a reference to two Rutgers reports and the inclusion of the map as Figure D.2-6 (Rutgers GI Opportunities), there is limited discussion of possible locations for GI opportunities in the City that would be needed to attain the impervious surface targets of 5% or 10% or if any of the locations within the Rutgers report are available. Please elaborate.

Comment 6

There is limited discussion within the report regarding the required evaluation of the alternatives concerning STP Expansion and CSO-related bypass. The Department acknowledges that the City of Newark 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. For example, is there adequate conveyance capacity to divert additional CSO flow to PVSC? Has there been discussion with PVSC about the acceptance of these flows? Please clarify.

In addition, on page 26 it is stated that Alt 1b, which entails delaying gate closure, “...provides a modest amount of reduction at little to no cost, and should continue to be considered as a CSO-control alternative.” Since PVSC owns/operates the regulatory, please provide discussion as to whether or not PVSC is amenable to this change.

Comment 7

Storage tanks are further discussed in Section D.2.3 (Alternative 3 - Storage) where the report explains that “an iterative approach was used to estimate the volume required for 0, 4, 8, 12, and 20 overflows... For this planning level analysis it was assumed that tanks can be located near the regulators or outfalls.” The total storage volume, approximate number of days to dewater, volume captured and percent CSO reduction is summarized in Table D-5 (Total CSO Storage Volumes and Reductions for 0, 4, 8, 12, and 20 Overflows) where Alt 3 (0 overflows) is determined to be infeasible.

Additional discussion needs to be included to explain if there is land available for storage and if any properties could sustain the cumulative total of the needed tank sizes referenced in Table D-5. 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 elaborate as to whether or not PVSC could accept stored tank flow or if there are any conveyance limitations that would prevent such.

Comment 8

Several alternatives for reducing I/I are described in Section D.2.4 (Alternative 4 – Inflow and Infiltration Reduction) including Alternative 4a, 4b and 4c. While information is provided for Alternative 4a on page 46, additional information is needed for Alt 4b and 4c to describe how these targeted reductions can be attained.

In addition, the report describes two significant sources of extraneous flow beginning on page 33 in Section D.2.4 where these sources tie directly into Newark’s combined sewer system where elimination of such is described as Alt 4. This includes flow from Branch Brook Lake and flow from the lake in Weequahic Park which comprise the largest sources of inflow at an average flow of 0.84 MGD and 1.31 MGD, respectively. It is further stated on page 46 that the report entitled “Extraneous Flow Investigations” (Arcadis, July 2018) “calculated cost for various alternative for removing the park inflows.” Several alternatives names are depicted in Table D-13 (Total Annual Cost Comparison Inflow Removal at Parks) for Weequahic Park namely the Meeker Avenue Alternative; NJ Transit Alternative; the Hollywood Avenue Alternative; and the Peddie Ditch Alternative as well as for Branch Brook Park namely the Branch Brook Park Road Alternative and the Lake Avenue Alternative. Please provide detail as to how these flows enter the system. In addition, please provide a description of the alternatives specified and how these alternatives would reduce or eliminate extraneous flows to the affected outfalls.

Comment 9

It is stated on page 34 in Section D.2.4 that “As part of the final alternative selection Newark will also investigate the removal or reduction of uncontrolled stormwater flows in the Jabez Interceptor and screenings wash water flows from floatables control facilities to the interceptor.” Similar language is included on page 46 under Section D.2.7 (Alternative 7 – Sewer Separation). Please explain and elaborate on any issues associated with the Jabez Interceptor related to I/I reduction. In addition, please show the location of the Jabez Interceptor and any affected outfalls on Figure D.2.-9 (Newark Extraneous Flow Inventory).

Comment 10

In Section D.2.6 (Alternative 6 – Satellite Treatment) the use of disinfection by Peracetic Acid (PAA) is discussed and it is stated on page 38 that “...disinfection of CSO satisfies CSO-control objectives.” It is also stated that “For the purposes of this analysis, disinfection facilities are designed to remove 99.9 percent (“3-log reduction”) of pathogens for full treatment.” Finally, it is further stated on page 38 that “PAA disinfection facilities can, in many cases, be sited upstream of each CSO outfall, at a location between the existing regulators and the existing screening/netting facility or collocated at a screening/netting facility.” Satellite treatment is also discussed in Section D.2.3 (Preliminary Selection of Alternatives) where the Flexfilter system is referenced as a pretreatment technology.

Please provide documentation and supporting analysis to justify the 3-log reduction as cited on page 38. It is also unclear if it is the City’s intention to include pretreatment technology to provide primary clarification and reduce settleable solids. Please clarify.

Comment 11

While cost analyses are provided within the report, particularly in Section D.2 (Preliminary Control Program Alternatives) and Section D.3 (Preliminary Selection of Alternatives), 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.

Comment 12

In Section D.3.2 (Regulatory Compliance) the report states that “The preliminary alternatives will result in full attainment of the existing pathogen water quality criteria providing the maximum bacterial reduction reasonably attainable.” The Department maintains that it is premature to include this statement prior to an approved LTCP and the implementation of CSO control alternatives. Please revise accordingly.

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,



Dwayne Kobesky
CSO Team Leader
Bureau of Surface Water Permitting

- C: Marzooq Alebus, Bureau of Surface Water Permitting
- Susan Rosenwinkel, Chief, Bureau of Surface Water Permitting
- Adam Sarafan, Bureau of Surface Water Permitting

Distribution List:

Bridget M. McKenna, Chief Operating Officer
Passaic Valley Sewage Commissioners
600 Wilson Avenue
Newark, NJ 07105

Tim Boyle, Superintendent
Bayonne City Municipal Utilities Authority
610 Avenue C, Room 11
Bayonne, NJ 07002

Brigite Goncalves, Chief Financial Officer
Borough of East Newark
34 Sherman Avenue
East Newark, NJ 07029

Rocco Russomanno, Town Engineer
Town of Harrison
318 Harrison Avenue
Harrison, NJ 07029

Frederick Margron, Town Engineer
City of Paterson
111 Broadway
Paterson, NJ 07505

Robert J. Smith, Town Administrator
Town of Kearny
402 Kearny Avenue
Kearny, NJ 07032

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

Frank Pestana, Executive Director
North Bergen Municipal Utilities Authority
6200 Tonnelle Avenue
North Bergen, NJ 07047