



State of New Jersey

PHIL MURPHY
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Mail Code – 401-02B
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

CATHERINE R. McCABE
Commissioner

SHEILA OLIVER
Lt. Governor

September 25, 2019

Tim Boyle, Superintendent
City of Bayonne
610 Avenue C, Room 11
Bayonne, NJ 07002

Re: Review of Development and Evaluation of Alternatives
City of Bayonne, NJPDES Permit No. NJ0109240

Dear Mr. Boyle:

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 2019 as submitted to the New Jersey Department of Environmental Protection (the Department or NJDEP) which contains the “Development and Evaluation of Alternatives” (hereafter “the report”) for the City of Bayonne. 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 B is specific to the City of Bayonne. This subject letter serves to provide a response to the “Development and Evaluation of Alternatives” report specific to the City of Bayonne (Appendix B) 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. 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) where this section also includes a description of the ancillary environmental, social and economic benefits of GI to the community. It is stated within this section on page 12 that GI "...is being evaluated in conjunction with other primary alternatives that are necessary to achieve volume and bacteria reduction goals for CSO control." It is further stated that GI will be refined and evaluated further and that the "City's citizen education and support services will continue to promote localized GI on a homeowner scale." More specific GI information is included in Section D.2.2 (Green Infrastructure).
- **STP Expansion** is discussed in Section C.6 (STP Expansion or Storage). It is explained on page 16 that the expansion of the STP is a possible alternative; however, due to local and regional hydraulic constraints, the amount of CSO flow that can be conveyed to PVSC is limited. Presently, the contracted flow rate to PVSC is 17.6 MGD and any flow above 20 MGD would require an increase in the capacity of the force main that is jointly owned by Jersey City MUA and Kearny MUA. It is then concluded that "Since Bayonne currently neither owns nor operates a wastewater treatment facility, STP expansion or modification for wet weather flow treatment or storage would not apply..." The report includes an analysis of increasing the capacity of the force main in Section D.2.7.
- Regarding **increased storage capacity in the collection system**, the report evaluated sewer system optimization in Section C.4 (Sewer System Optimization) including conveyance, regulator modifications, and outfall consolidation/relocation as primary technologies whereas real time control is identified as a complementary technology to be reviewed in combination with primary technologies. Findings for the primary technologies are as follows:
 - a) As described on page 14, improved or additional conveyance can be gained through either modification to flow control or by adding additional capacities to existing force mains or sewers. Conveyance factors for the Oak Street Pumping Station and force main are described further on page 40 of the report.

- b) In Section D.2.5 (Regulator Modifications) it is stated on page 39 that "...model results show raising regulator weirs did not change CSO-event counts and only slightly changed the CSO volume (~0.1%), primarily re-distributing CSO to other outfalls. More importantly, raising weirs increased water levels within the CSS, which in turn can increase the possibility of flooding basements or streets." It was then concluded that regulator modifications for in-line storage would not be further evaluated.
- c) Outfall consolidation/relocation is discussed on page 14 where it is explained that combining and relocating outfalls can minimize the number of CSO control facilities which works best for outfalls that are in close proximity to each other to minimize conveyance modifications. It is then concluded that outfall consolidation will be considered further as a viable primary CSO control technology in order to minimize the number of required satellite disinfection facilities and to reduce high frequency, low volume CSOs.

Various **storage** technologies are described in Section C.5 (Storage) with a more detailed analysis in Section D.2.8 (Storage Tunnels at Consolidated Locations) and D.2.9 (Storage Tunnels). Storage allows for CSOs to be captured, stored, and eventually pumped to a wastewater facility for treatment where off-line storage (tunnel, tanks) is considered to be a feasible alternative. Conceptual off-line storage tank facilities have been developed for each of the 28 individual CSO outfalls and for 9 consolidated facilities. Regional and local tunnels are also evaluated since tunnels provide more storage volume than pipelines and underground construction techniques result in minimal disruption to ground surface.

- **Inflow and infiltration (I/I) reduction** is described in Section C.3 (Infiltration and Inflow Control). Infiltration control is found to be not cost-effective based on a March 2007 report entitled "CSO Long Term Control Plan Cost & Performance Analysis Report, Vol. 1" by Hatch Mott MacDonald (2007, HMM) where these findings are supported by dry-weather flow measurements conducted in 2016 and 2017. Inflow is also discussed in this section where it is stated that because Bayonne's sewer system is mostly combined, inflow control would primarily focus on tidal impacts and "...investigation and control of tidal inflow will be retained as a program enhancement to protect against future increases of CSO."
- **Sewer separation** is described in Section C.7 (Sewer Separation) and Section D.2.4 (Sewer Separation). Section C.7 discusses the process of sewer separation and includes a reference to the previous cost evaluation (2007, HMM). Section C.7 further states that since Bayonne is an urban community, sewer separation would be disruptive to the neighborhood and the City has concerns regarding future permit requirements on stormwater discharges. However, as stated on page 16, sewer separation would completely eliminate CSOs and therefore sewer separation will be given further consideration and will be compared to the other alternatives.
- The report includes an evaluation of disinfection technologies for **satellite treatment** (i.e., treatment of the CSO discharge) in Section C.8 (Treatment of CSO Discharge) and in Section D.2.10 (Disinfection Technologies). Peracetic Acid (PAA) is described as having significant potential advantages over other CSO technologies. See **Comment 8** for additional detail.

Specific Comments

Comment 1

A 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. Section D.1.4 includes a brief discussion of public participation on the local level through the Bayonne Water Guardians. The Department acknowledges that a list of meetings and agendas for the regional PVSC CSO Supplemental Team, as well as a discussion of other public outreach, is included in your Public Participation Process Report dated June 2018. However, 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 Bayonne.

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 and the Bayonne Water Guardians 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. These alternatives are discussed in Section D.1.5 (Performance Considerations) and targets of 85 percent capture as well as 85 percent removal of pollutants of concern are identified as alternatives for the Presumption Approach. However, a specific approach has not been 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.

Section D.1.5 includes a reference to a memorandum “Evaluation of Alternatives Process (Memorandum),” Greeley and Hansen, January 7, 2019. In this memo it states that “Bayonne and the other Hudson County communities of North Bergen and Jersey City must reduce CSO volume by 59% in order to achieve the 85% volume capture performance metric.” 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.

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, as referenced in Section D.1.5, 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 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

Green Infrastructure is described in Section C.2 (Source Control) as well as in Section D.2.2 (Green Infrastructure (GI)). As stated on page 34 modeling analyses were applied to quantify the reduction from Baseline of CSO count and volume resulting from two levels of GI implementation. The first level of GI implementation involves elimination of runoff from the first inch of rainfall falling on 5% of the impervious surfaces in Bayonne, and the second involves elimination of runoff from the first inch of rainfall on 10% of the impervious surfaces. Both alternatives are equated to the number of approximate acres on page 34 to attain these targets and the CSO events and volume changes from the baseline are depicted in Table D-2 (Impacts on CSO Discharges of GI to Control Runoff from First Inch of Rain on 5% and 10% of Impervious Area). The Department notes that a quantitative metric such as acres 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.

While the report includes a reference to the Rutgers study “Green Infrastructure Feasibility Study, Bayonne,” on page 12 for possible locations for GI opportunities in Bayonne, there is limited specific information regarding the siting of potential GI projects. Additional discussion should be added regarding 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.

Comment 6

Tanks can be used to capture the most concentrated first flush and provide storage until conveyance and treatment capacity becomes available. On page 15 it is stated that Bayonne has an abandoned primary treatment tank with a capacity of 3.5 million gallons which could be used in conjunction with additional tankage to meet CSO control goals. The Department acknowledges that the use of this existing tank could assist as a pragmatic means of addressing a portion of CSO flow and the Department encourages use of such in the short term.

However, a significant limitation to the storage alternative is the capacity of the Oak Street Pump Station as well as the hydraulic limitations of the force main. As stated on page 40:

“According to an existing agreement with PVSC, the City can send wastewater to PVSC’s treatment Facilities at a peak rate of no more than 17.6 MGD (1986, PVSC). Based on its diameter, the existing Bayonne force main is hydraulically limited to approximately 20 MGD. Replacement of approximately 6,000 linear feet of the force main would be required to bring its entire length up to a consistent diameter of 36 inches, as necessary to hydraulically convey up to about 40 MGD.”

Storage is further described in Section D.2.7 (Storage) where Table D-5 (Off-Line Storage Tank Sizes Required at Individual Outfalls to Achieve CSO Frequency Goals) shows the tank volumes that would be required at the 28 individual outfalls without considering any capacity limitations for dewatering of any particular tank. It is then stated on page 41, “...only the 20 CSO-event/yr performance objective can be met on a City-wide basis with the current pumping limitation of 17.6 MGD at the Oak Street Pump Station... More stringent performance objectives, such as the 8- and 4 CSO events/yr targets, would require a conveyance capacity of 40 MGD from the Oak Street pump station and its force main, with a possible need for capacity improvement within other portions of the collection system.”

Based on the above, the conveyance capacity at the force main must be increased in order to consider storage as an alternative control.

Regarding the siting locations shown, please provide a brief description as to whether or not these locations have been explored regarding land ownership, availability etc. In addition, 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. Finally, given the hydraulic limitations, please describe whether any analysis has been conducted as to whether or not tanks could be used in concert with satellite treatment.

Comment 7

While cost analyses are provided within the report, particularly in Section D.2.11 (Summary of Cost Opinions) 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 8

Table D-26 (Example Plan Alternatives for CSO-Frequency Targets Control Alternative) includes different alternatives for various untreated CSO event counts/year including PAA Disinfection with FlexFilter Pretreatment as well as Consolidated Tank with Additional Conveyance. Prior to this reference within this table there is limited discussion of pretreatment technologies or the FlexFilter within the report. In fact, it is stated on page 48 that “...PAA disinfection facilities can be implemented upstream of each CSO outfall, at a location between the existing regulator and the existing netting facility. Recognizing the fact that Bayonne already meets the water quality standards for pathogens and that smaller space requirements and significant (~75%) cost savings could be realized if the disinfection facility is not provided with suspended solids removal. Therefore, Bayonne may consider disinfection without solids removal.” Please clarify the intentions for primary clarification and settleable solids removal.

In addition, in Table D-10 (Impacts of Disinfection for Range of CSO-Control Objective), footnote 2 states “In this context, “Untreated CSO Volume” is defined as the sum of discharged volumes during any 5-

minute period that exceed the design flow rate for 3-log pathogen removal.” Please provide documentation and supporting analysis to justify the 3-log reduction.

Comment 9

In Section D.3.3 (Selection of Preliminary Alternatives), the following is stated on page 65 with respect to ambient water quality:

“As noted above, Bayonne’s receiving waters already meet applicable water-quality standards and designated uses, including pathogen levels. Disinfection of CSO discharges would provide significant reductions of pathogens, which have been identified as the pollutant of concern.”

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 10

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.2.3. (Additional Conveyance of Wastewater) regarding the required evaluation of the alternatives concerning STP Expansion and CSO-related bypass. The Department acknowledges that Bayonne City 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.

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
Molly Jacoby, Bureau of Surface Water Permitting
Susan Rosenwinkel, Chief, Bureau of Surface Water Permitting

Distribution List:

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

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

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