CSO Municipalities: Belleville, Newark, Kearny & Jersey City
CSO Locations: Belleville, Newark, & Kearny
CSO Locations: Jersey City
CSO Siting Criteria and Considerations

1. CSO Target Storage Goals
   - Belleville: 50,000 - 100,000 Gallons
   - Newark: 150,000 - 200,000 Gallons
   - Kearny: 150,000 - 200,000 Gallons
   - Jersey City: 1M - 2M Gallons
   - Assumed stormwater only - no sewage
   - Municipalities responsible for getting volumes to storage locations

2. Site Selection & Placement
   - Physical Space
   - Topography
   - Proximity to Existing Drainage Infrastructure
   - Pumping Needs
   - Vehicular Access & Maintenance
   - Ground Water/Flood Hazard
   - Vehicular Loading
   - Soil Contamination/Excavation
   - Geology/Subsurface Constraints
   - Neighborhood/City Context
   - Rail Banking Requirements
   - Water Reuse Potential
   - Regulatory Codes & Municipal Design Standards

3. Design Implications
   - Limitations on Tree Planting/Shade
   - Integration with Program
   - Vehicular Access/Maintenance
   - Aesthetics and Visual Quality
   - Integration with Site SWM Requirements

Note: Siting locations are conceptual. Additional information and study is needed to determine the feasibility of the studies and potential sites for stormwater tanks shown in this set of studies. No information on municipal storm systems, topography, subsurface utilities, or topography survey was available at the time of this study.
HDPE Pipes are installed in a parallel configuration to allow flexibility to meet storage capacity needs. The pipe size and depth are determined by project needs and site conditions. This project utilized 54" and 60" diameter HDPE Pipe. Pipes are sized based on storage capacity goals and site conditions.

### System Sizing

<table>
<thead>
<tr>
<th>NOM. PIPE DIA. (IN)</th>
<th>GALLONS PER FOOT (GPF) OF PIPE</th>
<th>MIN. COVER (FT)</th>
<th>MAX. COVER (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>35.51</td>
<td>1.0</td>
<td>50</td>
</tr>
<tr>
<td>36</td>
<td>51.13</td>
<td>1.0</td>
<td>50</td>
</tr>
<tr>
<td>42</td>
<td>69.59</td>
<td>1.0</td>
<td>50</td>
</tr>
<tr>
<td>48</td>
<td>90.9</td>
<td>1.0</td>
<td>30</td>
</tr>
<tr>
<td>54</td>
<td>115.47</td>
<td>1.0</td>
<td>30</td>
</tr>
<tr>
<td>60</td>
<td>142.51</td>
<td>1.0</td>
<td>30</td>
</tr>
<tr>
<td>66</td>
<td>172.38</td>
<td>1.5</td>
<td>30</td>
</tr>
<tr>
<td>72</td>
<td>205.09</td>
<td>1.5</td>
<td>30</td>
</tr>
<tr>
<td>84</td>
<td>279.04</td>
<td>2.0</td>
<td>30</td>
</tr>
<tr>
<td>96</td>
<td>364.33</td>
<td>2.0</td>
<td>30</td>
</tr>
<tr>
<td>108</td>
<td>475.89</td>
<td>2.5</td>
<td>25</td>
</tr>
<tr>
<td>120</td>
<td>569.06</td>
<td>3.0</td>
<td>25</td>
</tr>
</tbody>
</table>
Steel Pipes are installed in a parallel configuration to allow flexibility to meet storage capacity needs.

Pipes ends are connected to create a continuous storage chamber. Alignments can be configured to be responsive to site conditions. This project utilized 12’ Diameter Pipes.
Pipe Size Design Considerations
Design Envelope for 3’, 6’, and 10’ Diameter Pipes and 100K Gallons of Storage

Smaller storage pipes reduce the need for deep excavation and limit conflicts with rock or ground water. More and longer pipes are needed for equivalent storage capacity. The expanded footprint may affect tree planting, shade, and programmatic opportunities for the greenway.

Larger storage pipes limit constraints to greenway program at the surface, but feasibility may be limited by ground water and bedrock.

3’ Diameter Pipe w
12” Min. Cover Required
5 Pipes
211’ L x 23’ W
Plus 15’ tree offset
100,000 Gallon Storage

6’ Diameter Pipe w
18” Min. Cover Required
3 Parallel Pipes
162’ L x 24’ W
Plus 15’ tree offset
100,000 Gallon Storage

10’ Diameter Pipe w
36” Min. Cover Required
2 Parallel Pipes
88’ L x 23’ W
Plus 15’ tree offset
100,000 Gallon Storage

15’ tree planting offset assumed on all sides of storage pipes
Potential restoration of rail service in the future may be considered in siting storage tanks. Preferred placement for CSO storage would locate storage 25' from the rail corridor and 15' from trees on-site or trees on neighboring properties. Within the 100' wide property a zone that meets all these criteria is not available. If rail service is returned in the future, then engineering review may require removal of subsurface tanks to ensure stability of the rail line.
Belleville CSO Storage Siting Study
10’ Diameter x 48’ Length HDPE Pipes

Four HDPE Pipes (10’ Dia x 48’ Length Each) would be installed parallel to the tracks. Locations along Greenfield Lake Dr. and Lavergne Ave. show potential for siting stormwater storage pipes.

Target Storage Capacity: 50,000 - 100,000 Gallons

Siting Considerations: Sites are relatively flat with vehicular access and outside of rail banking areas.

Unknowns: Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.
Belleville CSO Storage Siting Study
10’ Diameter x 48’ Length HDPE Pipes

BELLEVILLE LOCATION OPTION 2
4 PIPES (48’X10’DIAX27,000 GALLONS)
=108,000 GALLONS

BELLEVILLE LOCATION OPTION 1
4 PIPES (48’X10’DIAX27,000 GALLONS)
=108,000 GALLONS

Four HDPE Pipes (10’ Dia x 48’ Length Each) would be installed parallel to the tracks. Locations along Greenfield Lake Dr. and Lavergne Ave. show potential for siting stormwater storage pipes.

Target Storage Capacity: 50,000 - 100,000 Gallons

Siting Considerations: Sites are relatively flat with vehicular access and outside of rail banking areas.

Unknowns: Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.
Newark CSO Storage Siting Study
10’ Diameter x 48’ Length HDPE Pipes

Areas with siting potential - site is elevated above flood plain, alignment not included in rail banking, pumping likely required in some locations

Target Storage Capacity: 150,000 - 200,000 Gallons

Siting Considerations: Sites are relatively flat with vehicular access and outside of rail banking areas.

Unknowns: Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.
Newark CSO Storage Siting Study
10’ Diameter x 48’ Length HDPE Pipes

Target Storage Capacity: 150,000 - 200,000 Gallons

Siting Considerations: Sites are relatively flat with vehicular access and outside of rail banking areas.

Unknowns: Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.
Eight HDPE Pipes (10’ Dia x 48’ Length Each) would be installed parallel to the tracks. Locations near intersections provide easy access and potential to tie into storm pipes. Many variations and combinations of pipe layout configurations could be considered.

**Target Storage Capacity:** 150,000 - 200,000 Gallons

**Siting Considerations:** Sites are relatively flat with vehicular access and outside of rail banking areas.

**Unknowns:** Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.
Kearny CSO Storage Siting Study
10’ Diameter x 48’ Length HDPE Pipes

Target Storage Capacity: 150,000 – 200,000 Gallons

Siting Considerations: Sites are relatively flat with vehicular access and outside of rail banking areas.

Unknowns: Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.

Areas with siting potential - sites are elevated above flood plain, alignment not included in rail banking, and relatively flat.
Kearny CSO Storage Siting Study
10' Diameter x 48' Length HDPE Pipes

KEARNY LOCATION OPTION 1
8 PIPES (48’X10’DIAX27,000 GALLONS)
= 216,000 GALLONS

KEARNY LOCATION OPTION 2
8 PIPES (48’X10’DIAX27,000 GALLONS)
= 216,000 GALLONS

Eight HDPE Pipes (10’ Dia x 48’ Length Each) would be installed parallel to the tracks. Locations near intersections provide easy access and potential to tie into storm pipes. Many variations and combinations of pipe layout configurations could be considered.

Target Storage Capacity: 150,000 - 200,000 Gallons

Siting Considerations: Sites are relatively flat with vehicular access and outside of rail banking areas. Extents could impact potential for shade and trees.

Unknowns: Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.
Area with siting potential - site is elevated above flood plain, alignment not included in rail banking, pumping likely required, further studied for compatibility with NJ Transit Bergen Loop Track Project needed.

**Target Storage Capacity:** 1-2M Gallons

**Siting Considerations:** Area has limited opportunities. Site is relatively low with adjacent wetlands and high ground water and potential for flooding. Vehicular Access to adjacent parcels may limit capacity. Significant earthwork required.

**Unknowns:** Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.
Jersey City CSO Siting Study
10’ Diameter x 48’ Length HDPE Pipes

JERSEY CITY CSO SITING POTENTIAL:
USE HIGHER GROUND AND MODIFY TOPOGRAPHY
AS NEEDED TO CREATE REQUIRED CONDITIONS

(48’ L X 10’ DIA X 27,000 EA) UNDER GREENWAY
60 PIPES SHOWN. TOTAL VOLUME OF 1,620,000
GALLON CAPACITY

Target Storage Capacity: 1-2M Gallons

Siting Considerations: Area has limited opportunities. Site is relatively low with adjacent wetlands and high ground water and potential for flooding. Vehicular Access to adjacent parcels may limit capacity. Significant earthwork required.

Unknowns: Groundwater, subsurface conditions, connections to municipal storm system, pumping requirements. Municipal requirements. Additional information on these items will affect feasibility of studies.