

Sewer Type Definitions: to be used when describing the existing system

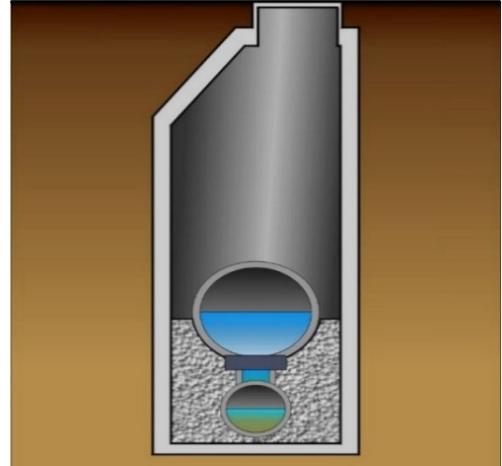
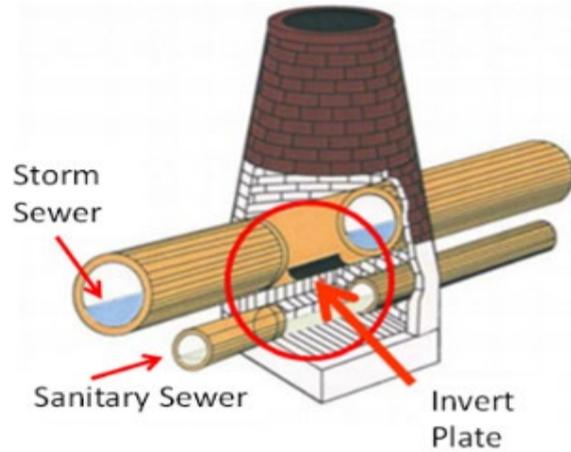
Common Trench

Both sanitary and storm sewers in the same trench, with the storm sewer either aligned on top of or next to the sanitary sewer. There are three types of Common Trench sewers.

Common Trench Over/Under

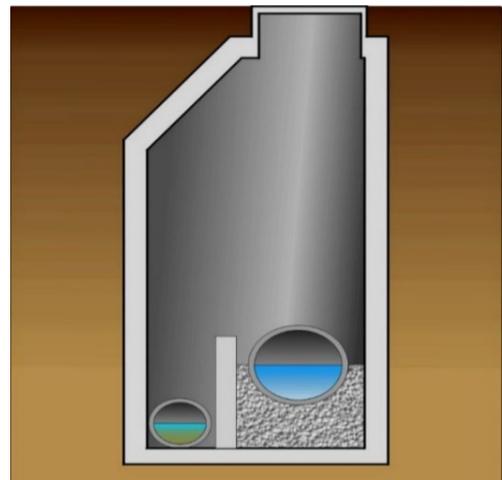
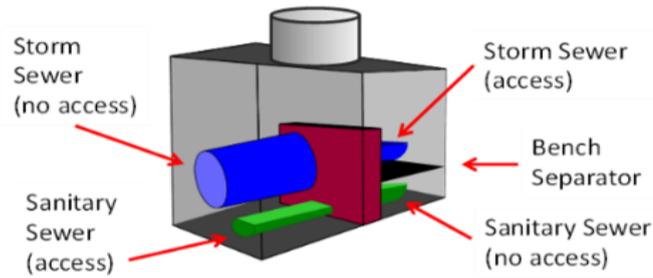
One manhole is used to access both the storm and the sanitary sewers, with a removal invert plate on the storm sewer to provide access to the sanitary sewer.

Some invert plates are found to be damaged, displaced, or missing, resulting in a direct connection between the storm and sanitary sewers.



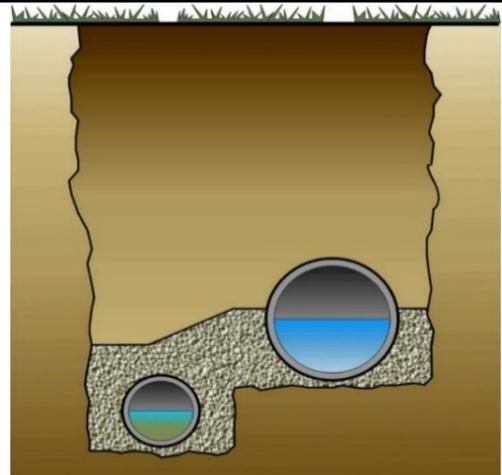
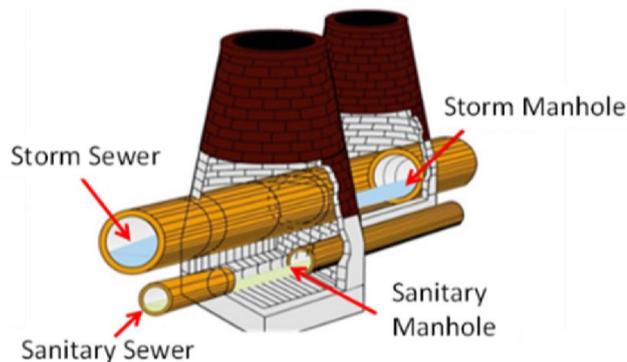
Common Trench Dividing Wall

One manhole is used to access both the storm and sanitary sewers. A vertical wall separates the storm and sanitary sewer access openings, such that flow from one sewer to the other at the manhole requires overtopping the dividing wall.



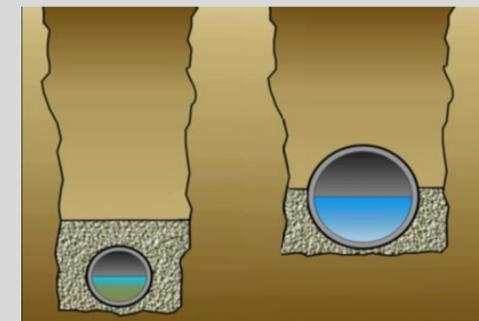
Common Trench Standard Manhole

Two manholes are constructed to allow separate access to each sewer in the common trench, but with no direct connections between the sewers.



Separate Trench

Sanitary and storm sewers in different trenches with separate manholes.



Combined Sewer

A single sewer designed to receive and transport both sanitary sewage and stormwater runoff in the same pipe.

Home Sewage Treatment Systems (HSTS)

Individual domestic wastewater disposal systems often located in areas without public sanitary collection systems.

Project Performance Verification Technical Guidance

The District requests data to support project performance verification to document how a MCIP project is performing. Performance verification may include pre-construction flow monitoring, pre- and post-construction water quality sampling, and/or desktop or hydraulic/hydrologic modeling depending on the type of project. Table 1 details options for types of performance verification activities suggested for various MCIP project types. This guidance should be considered when developing a performance verification plan and project budget. Beginning with projects awarded in 2024 that address inflow and infiltration reduction or elimination, communities will only be responsible for pre-construction flow monitoring (which can also be completed as part of design). The District will obtain post-construction monitoring data at a later date. A community may still choose to perform post-construction performance monitoring in order to validate performance if desired. All performance verification activities are eligible for MCIP funds.

Please note: Applicant is responsible for evaluating any potential downstream or upstream impacts of the proposed work on other users, or on the level of service of the infrastructure.

Table 1: Recommended Performance Verification Activities by Project Type

Project Type	Flow Monitoring	RDII evaluation	Water Quality Outfall Sampling
Combined Sewer Separation			Post
Common Trench Sewer Lining or Separation	Pre	Pre	
Separate Trench Sewer Lining or Replacement	Pre	Pre	
Lateral Repair	Pre	Pre	
Private Property I/I Reduction	Pre	Pre	
HSTS Removal			Pre and Post, dry weather
Illicit Connection Removal			Pre and Post, dry weather
SSO/CSO Control ¹	Pre and Post		
Relief Sewer/ Parallel Storage	Pre (existing sewer)		

¹ Option to monitor activations with level sensor at weir.

Table 1 is not a complete list of all MCIP-eligible project types but is provided for guidance. Questions regarding project eligibility should be directed to a District Watershed Team Leader or discussed during a pre-application meeting. Other project performance verification activities may include dye or smoke testing, Closed-Circuit Televising (CCTV), and/or other methods depending on the project.

Costs relating to performance verification activities should be included in the proposal. Communities must detail their anticipated method(s) of performance verification within the proposal, as well as complete the online District AGOL submittal. Instructions for this submittal can be found as part of the [MCIP Workshop StoryMap](#). The District will review project performance verification plans and may suggest additional or alternate locations for verification activities to fully capture the impact of the project.

Flow Monitoring and Rainfall Derived Inflow and Infiltration (RDII) Evaluation Guidelines

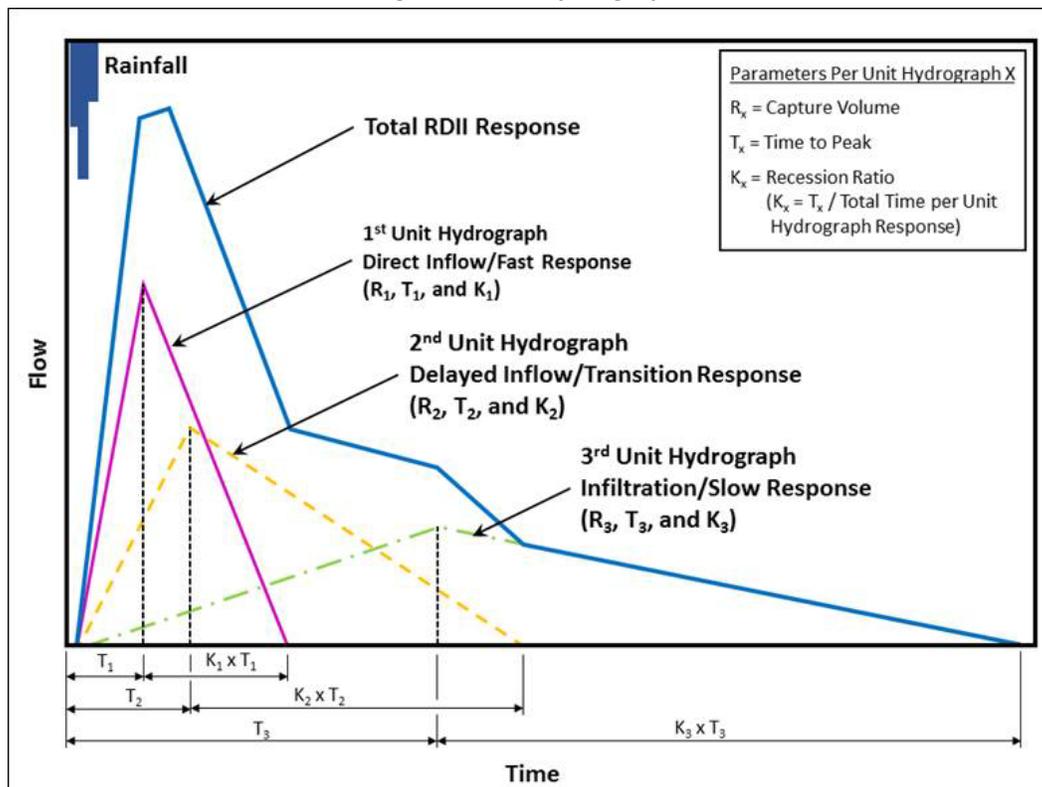
Objective

The objective of flow monitoring and RDII evaluation is to demonstrate sewer rehabilitation/replacement project performance by quantifying the resultant level of I/I reduction. For I/I reduction or elimination projects (including private property work), combined or common trench separation, and separate trench lining or replacement, the community is responsible to provide pre-construction flow monitoring and RDII evaluation. The District will complete post-construction monitoring at a later date. A community may elect to complete post-construction monitoring and additional project evaluation as part of their MCIP project; these performance verification costs can still be included in the funding request.

RDII Evaluation

Evaluation should follow the “RTK” method, which uses three triangular hydrographs as illustrated in **Figure 1** to estimate the wide range of response times associated with the effect of fast inflow and slower ground water infiltration. For additional information on RDII evaluation following the RTK method please reference Section 3.9 of the District’s [Hydrologic and Hydraulic Modeling for Sewer Systems Standards and Protocols](#).

Figure 1: RTK Hydrographs



The RDII analysis should provide RTK values for each of the three unit hydrographs for each qualifying event in the monitoring period. Minimum deliverables are outlined in the corresponding section below.

USEPA offers a free "SSOAP Toolbox" software which can be used for this analysis. Other available modeling tools may be used as desired by the member community.

Monitoring Duration and Siting

A twelve-week duration is recommended for pre- construction flow monitoring. Monitoring can end sooner if five storms that meet either of the following criteria are captured:

- Rain event meets or exceeds a depth of 0.2 inches AND an intensity of 0.25 inches/hour
- 24-hour rainfall is greater than 0.75 inches

Data collected should include, but is not limited to: flow depth, velocity, and flow rate, recorded in 5-minute intervals. The community should identify any alternative monitoring plan (e.g., level monitoring) in their proposal. The data collection over the monitoring periods should be continuous.

In the case where pre-construction flow monitoring has already been completed at the time of application, the community should submit in their proposal via the District AGOL portal the monitor locations and data collected or summary of findings for review by the District to support the scoring of the project.

In general, flow monitors should be placed to isolate flows within the MCIP project area. When possible, pre-construction monitoring should be scheduled to occur during rainier months (i.e. April through September) The District will review all proposed monitoring plans submitted during the application process and, if requested, can assist with site selection of flow monitors and rain gauges.

Rain Data

The District owns and maintains a network of rain gauges that may be sufficient for the project's needs. The community should determine if additional temporary rain gauges are necessary for verification activities. **Figure 2** shows the locations of District rain gauges. Rain gauge data requests should be sent to Matt Fedak, Data Analyst with the NEORS D Systems Integration Department (fedakm@neorsd.org). Gauge-adjusted radar rainfall data is also available for the District service area. Requests for that data should be sent to George Remias (remiasg@neorsd.org).

Figure 2: District Rain Gauge Locations



To view a more detailed Rain Gauge map, please visit the following link: <http://arcgis/10KTCr>

Minimum Deliverables (Flow Monitoring)

The following deliverables should be submitted to the District and can be included in quarterly progress updates:

- Site installation forms
- Rain data, 5-minute intervals (tabular data)
- Raw and edited flow monitoring data, 5-minute intervals (tabular data)
- RDII-evaluation report/summary including:
 - Discussion on methodology and findings
 - Drainage area (acres)
 - RTK values (including sub-values for each parameter)
 - Rain data analysis (number of storms, intensity, and volume)
 - Assumed dry weather flow (DWF, tabular data)
 - Assumed base wastewater flow (BWF, tabular data)
 - Assumed groundwater infiltration (GWI)

Dry Weather Water Quality Outfall Sampling Guidelines

For projects focused on illicit discharge and HSTS elimination, or combined sewer separation, the District recommends dry-weather water quality sampling. The objective of this sampling is to obtain data that quantifies the approximate pollutant load reduction resulting from the infrastructure improvement identified in the MCIP project proposal and/or verifies separation. Pre-construction sampling should indicate elevated pollutant levels. Post-construction performance verification should consist of sampling from the same locations used for pre-construction sampling, or representative location, as applicable. Dry weather sampling locations include end of pipe samples from illicit discharges or outfalls. Sampling events should occur at three separate times for each identified outfall, in order to ensure a representative E. coli measurement.

Minimum Deliverables (Water Quality Sampling)

The following deliverables should be submitted to the District and can be included in quarterly progress updates:

- Field sample collection report
- Sample analysis results