

DSN015-STOR-4 (KC & SPU) or SC-University-Collab-STOR

Alternative DSN015-STOR-4 (KC & SPU) controls King County's University CSOs and SPU's North Union Bay CSOs by building a storage tank adjacent to the North Interceptor. This alternative is a collaborative alternative that was developed by King County.

Design Criteria

- King County Storage Volume Requirement: 2.94 MG¹ (University)
- SPU Storage Volume Requirement: 2.29 MG (North Union Bay)
- King County CSO Peak Flow Rate for Sizing Conveyance to Storage: 94.7 MGD¹ (University)
- SPU CSO Peak Flow Rate for Sizing Conveyance to Storage: 17.2 MGD (North Union Bay)
- Storage tank is required to drain within 12 hours of event.

Description

Alternative DSN015-STOR-4 (KC & SPU) consists of a storage tank to control King County University CSOs and SPU North Union Bay CSOs. A CSO control volume of approximately 2.94 MG¹ is required to reduce overflows at the University CSO Outfall to an average of one untreated discharge per year. A CSO control volume of approximately 2.29 MG is required to reduce SPU's North Union Bay CSOs. A total maximum storage volume of 5.23 MG is required to control the two CSO outfalls. Storage of this volume could be provided with an offline storage tank located within or adjacent to the approximate boundary shown in Figure G.1.3-2. See Section 6.1 Planning-Level Sizing Assumptions for criteria and assumptions used in establishing the approximate boundary. This alternative does not include the conveyance components and costs associated with SPU conveying flows to the storage tank.

The main components of this alternative would include:

- 5.23-MG offline storage tank with pumps to empty the storage tank.
- Facilities building(s) to house electrical/control/odor control equipment and a standby generator.
- A new regulator station (diversion structure) along the North Interceptor to divert King County CSOs to the storage tank.
- Up to approximately 1,570 ft of 30-inch-diameter force main, depending on the location selected for the offline storage tank within or adjacent to the approximate boundary shown in Figure G.1.3-2.
- Up to approximately 3,130 ft of 60-inch-diameter influent gravity sewer, depending on the location selected for the offline storage tank within or adjacent to the approximate boundary shown in Figure G.1.3-2.

¹ This alternative assumes that flows are diverted upstream of the University Regulator Station along the North Interceptor. Refined modeling may indicate an increase in storage volume and conveyance size to control University CSOs.

Storage Tank

The CSO control volume for King County and SPU could be stored in a buried, rectangular structure, approximately 350 feet long and 130 feet wide with a sidewater depth of approximately 20 feet.

Flows would enter the storage tank during a wet-weather event. The tank may be configured with multiple chambers, so that only those chambers required to store the volume of the wet-weather event would be used. Storage of flows would start in the first chamber and as that chamber fills and reaches capacity, flows would be transferred into subsequent chambers until either the wet-weather event ends or the capacity of the storage tank is reached. Each chamber would contain equipment for flushing and self-cleaning, and only chambers used in a wet-weather event would require flushing. Control of odors and sediment in the storage chambers may require regularly-scheduled cleaning between events.

Facilities Building(s)

Facilities building(s) would be located above or below ground level and would contain an odor control system, electrical controls, and a standby generator. The actual contents of the building(s) will be determined during preferred alternative development. The representative footprint shown in Figure G.1.3-2 for this alternative locates the facilities buildings adjacent to the storage tank for conservative purposes; however, the facilities buildings could be located above the storage tank to minimize space requirements.

Flow Diversion and Discharge

One regulator station will be required to divert King County and SPU flows from the North Interceptor to the storage tank. For this planning phase, it is assumed that the diversion would occur at King County manhole WW*NINT.N16-11. Evaluation of whether flows can be diverted upstream of this manhole or at a different location along the North Interceptor will be completed during preferred alternative development. Diverted King County and SPU flow would discharge to the location of the storage tank via a 60-inch-diameter influent gravity sewer. The length of the influent gravity sewer will vary depending on the selected location of the offline storage tank, which will be evaluated during preferred alternative development. The influent gravity sewer can be up to 3,130 feet long based on the criteria and assumptions listed in Section 6.1.

After a wet-weather event, the chambers inside the storage tank would drain to a common sump. Submersible pump(s) would transfer stored sewage from the sump back into the King County North Interceptor through a 30-inch-diameter force main that is up to approximately 1,570 feet in length. The length of the force main will vary depending on the selected location of the offline storage tank, which will be evaluated during preferred alternative development.

Construction Assumptions

King County's Tabula cost estimating program was used to develop a Class 5 estimate for this alternative. The attached documentation lists the construction assumptions used.