

Metropolitan St. Louis Sewer District (MSD) Saves Thousands of Dollars in Sewer Inspection Costs

Combined Sewer Overflow Monitoring: Dry Weather Overflow Avoidance

The older portions of St. Louis MSD's service area have a combined sewer system dating back to the 1850s. Within the system, there are many Combined Sewer Overflows (CSOs) and associated dry-weather diversions, or "interceptors" in the local vernacular. Design and construction practices in the early to mid-1900s were focused on weir walls, interceptor grates, and manual inspection and cleaning operations to minimize overflows.

The "Simms Interceptor", shown in the photo to the right, is an example of this practice. When major projects are underway, the Simms Interceptor and other weir walls, dry-weather diversion pipes, and interceptor grates must be monitored and maintained to avoid dry-weather overflows due to clogging of the grates and pipes.

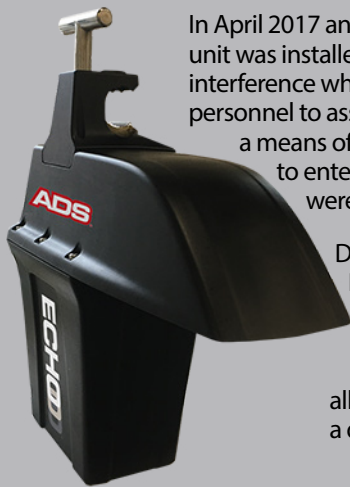


Simms Interceptor Structure
St. Louis, MO (MH 21K3-0021C)

Historically, crews had to visit the Simms Interceptor and similar locations two to three times per week to observe and document conditions. In addition, any excessive debris partially clogging the bar-screen and/or the mouth of the 18-inch pipe leaving the structure was cleared. Some diversion structures require confined-space entry to view the interceptor grate, although this is not the case for the Simms Interceptor location. In the end, maintenance inspections are scheduled several times per week to ensure that dry-weather overflows never occur due to clogged conditions.

In the Missouri tradition, District Operations gave the St. Louis ADS staff the "Show Me" option – "Show us that the ADS ECHO works at the Simms Interceptor and then we can discuss the more difficult access locations."

ADS ECHO Level Measurement Accuracy and Reliability... Problem Solved.



In April 2017 an ADS ECHO level monitor was installed at the Simms Interceptor as shown in the photo below. The unit was installed several feet below the manhole frame and on the wall opposite the manhole steps, for minimal interference when entering the structure. The objective of this installation was to allow District Operations personnel to assess the accuracy and reliability of the ADS ECHO and to evaluate the option of using level data as a means of reducing crew visits to the structure. Most of the time an inspection visit would result in no need to enter the structure to clear debris. But even on these no entry visits, significant and repetitive costs were incurred.

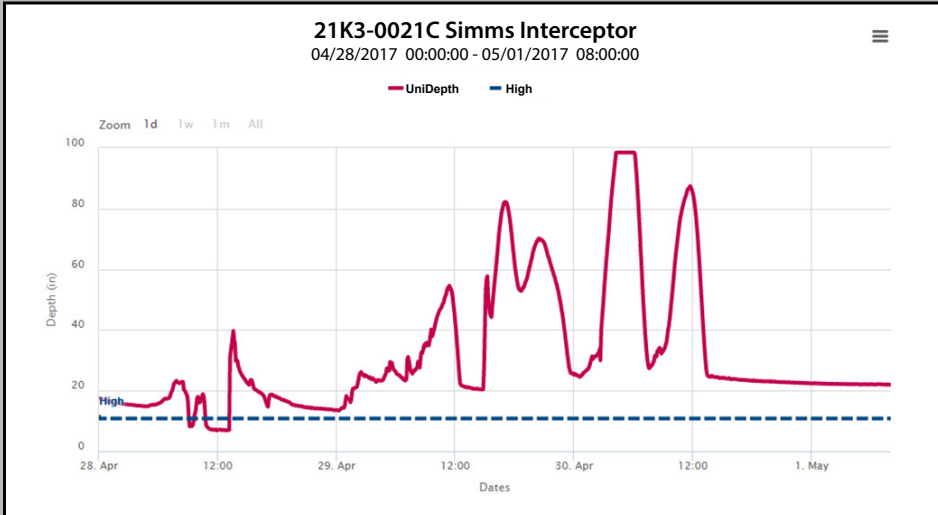
Data recorded by the ADS ECHO were made visible to the District staff via ADS's FlowView web-hosted software. In addition, text and email alarms were sent to key personnel when the depth of sewage upstream of the weir wall reached 60% of its total height. The alarms allowed sufficient time for clearing collected debris before a dry-weather event could occur at the Simms Interceptor.



"We recently installed an ADS ECHO at one of our CSOs and have already reduced our field inspections by 67%. The ECHO alerts our crews directly when the flow has reached a certain level so that they can respond and prevent dry weather bypasses. We have identified other "problem" CSOs in our system and are in the process of installing additional ECHOs so that we can further reduce manual inspections while eliminating the possibility of dry-weather bypasses."

Brian McGownd, Operations Division Manager
Metropolitan St. Louis Sewer District (August 2017)





Shortly after installation, another feature of the ADS ECHO was tested by Mother Nature before the intended purpose could be evaluated. The FlowView graph at the left shows a depth of water 98.5" above the base of the weir wall as a result of flood-inducing rains at the end of April 2017. The unit responded very well to rapid changes in depth leaving no doubt that the weir was over-topped.

The depth plot at the bottom of the page shows the information collected by the ADS ECHO monitor in late July and early August, 2017. The blue dashed line marks the predetermined alarm level mentioned earlier at 10.8-inches above the base of the weir wall and 6.0-inches from the top of the weir. This buffer zone was determined by Operations staff familiar with the location to ensure that District crews would have sufficient time to mobilize, enter, and clear debris clogging the grate over the 18-inch diversion pipe.

In the depth plot below, the level within the Simms Interceptor stayed fairly consistent between July 23 and August 4. Once the grate was cleaned on August 4, the depth dropped over four inches. The level then slowly increased over seven days, resulting in another visit to clean the bar-screen. After cleaning on August 11, the water level again dropped by over four inches. Over the course of three weeks, the maintenance crews only visited twice. This is a reduction of four official visits, or 67%!

Going forward, the ADS ECHO system and FlowView platform will provide the District Operations staff with an historical database to evaluate recent and past performance trends at each interceptor. Armed with this data, the District will be able to provide targeted "on demand" cleaning, directing staff and resources to the locations in need of maintenance thereby saving time and money. Eventually the "Combined Sewer Overflow Long-Term Control Plan" will result in the redesign or elimination of interceptor locations. Until that day comes, the Operations Managers must use the most cost-effective, innovative new technologies, such as the ADS ECHO, along with tried-and-true practices to keep sewage from going over the weirs.

