

## SSO Observations – “Block and String” Method

In March 2019 the City Collection Crew installed “block and string” devices in each sanitary sewer overflow pipe to tentatively determine the frequency of the overflows. A block of wood was attached to a string and inserted into the overflow pipe in the corresponding sanitary manholes. The other end of the string was attached to the upper portion of the manhole. If an overflow occurred the block of wood would be carried downstream toward the storm sewer. The City could then record that an overflow occurred. If the block of wood would travel back into the sanitary manhole, it would indicate that the storm water was coming back into the sanitary collection system due to a rising stream or surcharged storm sewer. The Collection Crew would check each “block and string” after a rainfall or high flow event. Below is a picture of the “block and string” method in the Orchard & Tolbert SSO.



SSO events after blocks of wood and string were installed.

Address	4/15/2019	4/22/2019	5/9/2019	6/1/2019	6/6/2019	6/10/2019	6/12/2019	6/14/2019	6/16/2019	6/17/2019	6/20/2019	6/25/2019	7/1/2019	7/3/2019	7/17/2019	7/22/2019
Orchard @ Tolbert	N	N	N	N	N	N	N			Y		N	N	N	N	N
Orchard @ Simcox	N	N	N	N	N	N	N		Y	Y		N	N	N	N	N
Ringer	N	N	N	N	N	N	N			N*		N	N	N	N	N
Rainbow @ Mill St.	U	U	U	Y	Y	N	U		Y	Y	Y	Y	N	N	Y	Y
271 Brouse Dr. (by old lift station)	N	N	N*	N	N	N	N			N*		N	N*	N	N*	N
253 Broad St.	N	N	N	N	N	N	N			N*		N	N	N	N*	N
236 Mills St.	N	N	N*	N	N	N	N			N*		N	N*	N	N*	N
251 Main in front of Conval	N	N	Y	N	N	N	N		Y	Y		N	N	N	Y	N
Brookwood lift station	N	N	N	N	N	N	N			Y		N	N	N	N	N
<b>Peak flow at plant (MGD)</b>	8	7.56	8.85	10.11	9.56	8.26	6.54	11.75	11.73	15.73	13.36	12.26	6.47	5.11	10.74	9.35
<b>Total precipitation of event (inches)</b>	0.75	0.6	0.68	1.45	1.07	0.6	0.45	0.79	1.62	3	0.72	1.03	0	0.25	2.19	0.86
<b>Duration</b>																

Continued

Address	8/7/2019	8/8/2019	8/19/2019	8/21/2019	9/13/2019	9/30/2019	10/16/2019	10/28/2019	10/31/2019	12/2/2019	12/9/2019	12/30/2019	1/11/2020	1/19/2020
Orchard @ Tolbert	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Orchard @ Simcox	N	N	N	N*	N	N	N	N	N	N	N	N	N	N
Ringer	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Rainbow @ Mill St.	N	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y
271 Brouse Dr. (by old lift station)	N	N	N	N*	N	N	N	N	N	N	N	N	N	N
253 Broad St.	N	N	N	N	N	N	N	N	N	N	N	N	N	N
236 Mills St.	N	N*	N	N*	N	N	N	N	N	N	N	Y	N	N
251 Main in front of Conval	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N
Brookwood lift station	N	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Peak flow at plant (MGD)</b>	8.71	8.22	4.86	6.89	6.56	4.84	4.76	4.99	4.4	6.17	7.29	6.78	7.69	9.82
<b>Total precipitation of event (inches)</b>	0.47	0	0.54	0.32	0.76	0.49	0.28	0.75	0.32	0.56	0.65	0.84	0.84	0.66
<b>Duration</b>						7	6	14	6	10	6.5	24	48	7

Notes

4/15/19 - 4/13 0.18" and 4/14 0.57" of rain was recorded (total for event 0.75")
4/20/19 - 0.6" of rain was recorded
5/15/19 - 0.68" of rain was recorded. *Brouse and Mills both had stormwater enter into the sanitary sewer
6/1/19 - 1.45" of rain fell in a fairly short amount of time. Came as severe storms. It was discovered that the overflow at Rainbow and Mill may have discharged prior to the 6/1 storm event.
6/6/19 - 1.07" of rain fell. This rain came as severe storms several times during the day for a short duration of time.
6/10/19 - 0.6" of rain fell. This rain came as severe storms several times during the day over a 8 hour period.
6/12/19 - It is unknown if the SSO at Rainbow & Mill discharged. The block of wood is stuck further down the line and into the storm sewer. Unable to pull it back. Will need to wait until stream flows go down to pull back.
6/14/19 -
6/15/19 - Not all SSO's were checked due to being on a weekend.
6/17/19 - Simcox, Rainbow & Main continued to be in overflow from the 16th. N* had storm sewer coming back into the sanitary sewer. Total rainfall during the last three days was 5.41". Plant was flooded!
6/20/19 - Rainbow & Mill continued to be in overflow from the 17th.
6/25/19 - Rainbow & Mill continued to be in overflow from the 17th but had gotten more rain in between.
7/1/19 - N* had stormwater come back into the sanitary. We did not measure any precipitation at the plant. These were very spotty thunderstorms.
7/3/19 - No overflows from very spotty sotrms.
7/17/19 - N* had stormwater come back into the sanitary. Rainfall over 2" in less than 12 hours. At 8:00 am Rainbow&Mill the overflow pipe was at 90% flowing and Main St the overflow was not visible.
7/22/19 - Rainbow was actively overflowing in the morning. All others were good! 7/23 0745 done bypassing.
8/7/19 - Received .47" of rain during pop up thunderstorms. No overflows activated!
8/8/19 - Received ???" of rain during pop up thunderstorms. Mills had stormwater come back into the sanitary sewer. No rainfall recorded at the plant.
8/9/19 - Weather station was installed at the WWTP
8/19/19-No overflows. Received .54" of rain in thunderstorm events.
8/21/19 - N* had stormwater come back into sanitary sewer. Received 0.32" of rain during thunderstorm event in a short amount of time.
9/13/19 - Stormed for about one hour. Received 0.76 in about 1 hr 15 minutes. We have not received any substantial amount of rain in about 3 weeks.
9/30/19 - Rained for about 7 hours and got .49" of rain.
10/16/19 - No overflows reported. A root mass was removed from downstream of the Rainbow/Mill overflow last week. Got .28" of rain in about 6 hours

10/28/19 - We received 1" of rain in a 14 hour period over the weekend. The ground was very dry as we haven't gotten any significant rain in the last several weeks.

10/31/19 - Received .32" of rain in a 6 hour period.

12/2/19 - Received .56" of rain in a 10 hour period. This was light rain over a long period of time. Also ground was still dry.

12/9/19 - Received 0.65" of rain in a 6.5 hour period. Steady rain for most of the time.

12/30/19 - Received 0.84" of rain in 24 hours. This rain was steady with periods of downpours at times. Ground is saturated after rainfall.

1/11/20 - It rained off and on for about 48 hours.

1/20/20 - Received about 3" of snow and then rained on top of it. The total event lasted about 24 hours but snowmelt and rain was about 7 hours.