



**Combined Sewer Overflow  
Public Notification Program  
2021 Annual Report**

**City of Lakewood, Ohio  
May 1, 2022**

**Ver. 2022-04-12**

City of Lakewood, Ohio  
 CSO Public Notification Program  
 Annual Report for 2021

The City of Lakewood has combined sewer overflows (CSOs) on Lake Erie and Rocky River. Public access areas affected by CSOs are Rocky River and Lake Erie beaches. The City notifies the public by email and on a website within four (4) hours of being made aware of a CSO event. Lakewood reports CSO activity monthly to the Ohio EPA, and annually to the US EPA.

The City has three (3) rain gauges that recorded 31.60 to 35.72 inches of total rainfall throughout the year. The rainfall for 2021 was less than 2020. The number of CSO events was less as well as the total CSO volume. By comparison, the 2021 rainfall was closer to 2019. Table 1 lists the values of CSO events and rainfall (average of the three gauges) for the past four years.

<b>Table 1</b>			
<b>Annual CSO and Rainfall Data</b>			
Year	Number of CSO Events	Total Million Gallons (MG) of CSO Volume	Total Yearly Rainfall (in)
2018	83	198.82	43.85
2019	68	197.72	34.26
2020	76	305.83	38.93
2021	68	169.17	33.95

The rainfall led to sixty-eight (68) combined sewer overflow events in 2021. Table 2 is a listing of these wet weather CSO events for 2021. The last column of Table 2, Total Rain (in), is the rainfall only for events that produced one or more CSOs. The total rainfall of these events is less than the total for the entire year. Figure 1 is a map showing the locations of the outfalls listed in Table 2.

<b>Table 2</b>						
<b>Wet Weather Events Producing CSOs</b>						
Event	Outfall	Event Start	Event End	Total Volume (MG)	Duration (Hrs)	Total Rain (in)
1 <sup>1,2</sup>	RRES 1145	1/1/21 11:50 AM	1/1/21 10:45 PM	0.07	10.9	0.93
	LEWS 1055	1/1/21 11:50 AM	1/2/21 12:55 AM	0.27	13.1	
	LEWS 1040	1/1/21 11:55 AM	1/1/21 11:15 PM	0.44	11.3	
	CSO-055	1/1/21 11:55 AM	1/2/21 12:40 AM	0.21	12.8	
	CSO-056B	1/1/21 11:55 AM	1/2/21 2:05 AM	1.90	14.2	
	CSO-052	1/1/21 11:55 AM	1/2/21 2:15 AM	5.06	14.3	
	CSO-056A	1/1/21 12:05 PM	1/2/21 1:40 AM	0.51	13.6	
	CSO-002	1/1/21 12:05 PM	1/2/21 4:40 AM	4.30	16.6	
	LEWS 1070	1/1/21 12:45 PM	1/2/21 5:20 AM	0.40	16.6	
	LEWS 1045	1/1/21 2:35 PM	1/2/21 2:20 AM	0.10	11.8	
	CSO-059	1/1/21 2:35 PM	1/2/21 3:15 AM	1.83	12.7	
	LEWS 1190	1/1/21 2:50 PM	1/1/21 10:55 PM	0.05	8.1	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
2 <sup>1,2</sup>	CSO-002	2/24/21 12:40 PM	2/24/21 6:40 PM	0.49	6.0	0.0 <sup>3</sup>
	CSO-052	2/24/21 1:00 PM	2/24/21 6:05 PM	0.64	5.1	
	LEWS 1070	2/24/21 3:15 PM	2/24/21 5:55 PM	0.01	2.7	
3 <sup>1,2</sup>	CSO-052	2/27/21 6:35 AM	2/27/21 7:45 AM	0.32	1.2	0.13
	CSO-056B	2/27/21 6:40 AM	2/27/21 7:10 AM	0.02	0.5	
4 <sup>1,2</sup>	LEWS 1040	3/18/21 8:55 AM	3/18/21 4:25 PM	0.29	7.5	0.70
	CSO-052	3/18/21 9:25 AM	3/18/21 4:35 PM	1.30	7.2	
	CSO-002	3/18/21 11:55 AM	3/18/21 5:00 PM	1.10	5.1	
	CSO-056B	3/18/21 12:35 PM	3/18/21 4:25 PM	0.35	3.8	
	RRES 1145	3/18/21 12:40 PM	3/18/21 3:25 PM	0.01	2.8	
	LEWS 1070	3/18/21 12:55 PM	3/18/21 5:35 PM	0.11	4.7	
	CSO-056A	3/18/21 1:05 PM	3/18/21 4:20 PM	0.13	3.3	
	LEWS 1045	3/18/21 1:20 PM	3/18/21 4:30 PM	0.03	3.2	
CSO-059	3/18/21 1:20 PM	3/18/21 4:50 PM	0.35	3.5		
5 <sup>1,2</sup>	RRES 1145	3/25/21 11:10 PM	3/26/21 3:25 AM	0.01	4.3	0.33
	CSO-055	3/26/21 2:55 AM	3/26/21 3:30 AM	0.09	0.6	
	LEWS 1055	3/26/21 2:55 AM	3/26/21 3:35 AM	0.02	0.7	
	CSO-056B	3/26/21 2:55 AM	3/26/21 3:45 AM	0.12	0.8	
	CSO-056A	3/26/21 3:00 AM	3/26/21 3:40 AM	0.05	0.7	
	LEWS 1040	3/26/21 3:00 AM	3/26/21 4:00 AM	0.04	1.0	
	CSO-052	3/26/21 3:10 AM	3/26/21 4:00 AM	0.39	0.8	
6 <sup>1,2</sup>	CSO-055	3/28/21 6:50 AM	3/28/21 9:55 AM	0.06	3.1	0.23
	CSO-052	3/28/21 9:35 AM	3/28/21 10:30 AM	0.08	0.9	
7 <sup>1,2</sup>	CSO-055	4/8/21 5:00 PM	4/9/21 2:25 AM	0.10	9.4	0.19
	CSO-052	4/9/21 12:25 AM	4/9/21 1:25 AM	0.16	1.0	
	LEWS 1040	4/9/21 12:40 AM	4/9/21 1:30 AM	0.01	0.8	
8 <sup>1,2</sup>	CSO-055	4/10/21 9:20 PM	4/12/21 1:20 PM	1.04	40.0	0.55
	RRES 1145	4/10/21 9:35 PM	4/10/21 10:45 PM	0.01	1.2	
	LEWS 1055	4/10/21 9:35 PM	4/10/21 11:20 PM	0.04	1.8	
	LEWS 1040	4/10/21 9:35 PM	4/10/21 11:45 PM	0.18	2.2	
	CSO-052	4/10/21 9:40 PM	4/10/21 11:40 PM	0.69	2.0	
	CSO-056B	4/10/21 9:45 PM	4/10/21 11:40 PM	0.22	1.9	
	CSO-056A	4/10/21 9:55 PM	4/10/21 11:35 PM	0.03	1.7	
	CSO-059	4/10/21 10:00 PM	4/10/21 11:55 PM	0.12	1.9	
	LEWS 1070	4/10/21 10:20 PM	4/11/21 12:25 AM	0.04	2.1	
CSO-052	4/12/21 9:55 AM	4/12/21 10:40 AM	0.17	0.8		

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
9 <sup>1,2</sup>	CSO-055	4/18/21 12:05 PM	4/18/21 12:30 PM	0.06	0.4	0.04
	RRES 1145	4/18/21 12:05 PM	4/18/21 12:40 PM	0.02	0.6	
	CSO-056B	4/18/21 12:10 PM	4/18/21 12:40 PM	0.05	0.5	
	CSO-056A	4/18/21 12:15 PM	4/18/21 12:40 PM	0.01	0.4	
10 <sup>1</sup>	LEWS 1040	4/21/21 11:25 AM	4/21/21 1:00 PM	0.05	1.6	0.32
11 <sup>1</sup>	LEWS 1040	4/22/21 8:40 AM	4/22/21 9:35 AM	0.02	0.9	0.13
12 <sup>1,2</sup>	LEWS 1055	4/29/21 2:45 AM	4/29/21 1:05 PM	0.25	10.3	1.35
	RRES 1145	4/29/21 2:45 AM	4/29/21 5:35 PM	0.08	14.8	
	CSO-056B	4/29/21 2:50 AM	4/29/21 6:15 PM	2.72	15.4	
	CSO-055	4/29/21 2:55 AM	4/29/21 12:10 PM	0.13	9.3	
	LEWS 1040	4/29/21 2:55 AM	4/29/21 1:00 PM	0.67	10.1	
	CSO-052	4/29/21 2:55 AM	4/29/21 6:20 PM	5.25	15.4	
	CSO-056A	4/29/21 3:00 AM	4/29/21 6:00 PM	0.62	15.0	
	CSO-059	4/29/21 6:45 AM	4/29/21 6:35 PM	1.71	11.8	
	LEWS 1070	4/29/21 7:10 AM	4/29/21 7:40 PM	0.35	12.5	
	LEWS 1190	4/29/21 7:20 AM	4/29/21 12:10 PM	0.05	4.8	
	LEWS 1045	4/29/21 7:30 AM	4/29/21 5:45 PM	0.05	10.3	
CSO-002	4/29/21 9:25 AM	4/29/21 7:10 PM	1.98	9.8		
13 <sup>2</sup>	CSO-052	4/30/21 10:25 AM	4/30/21 10:55 AM	0.04	0.5	0.08
14 <sup>2</sup>	CSO-052	5/3/21 6:50 AM	5/3/21 7:40 AM	0.10	0.8	0.19
15 <sup>2</sup>	CSO-052	5/6/21 10:10 PM	5/6/21 10:50 PM	0.07	0.7	0.16
16 <sup>1,2</sup>	RRES 1145	5/7/21 6:15 PM	5/7/21 11:50 PM	0.02	5.6	0.48
	LEWS 1040	5/7/21 6:25 PM	5/8/21 12:35 AM	0.16	6.2	
	CSO-055	5/7/21 10:25 PM	5/7/21 11:35 PM	0.06	1.2	
	CSO-052	5/7/21 10:30 PM	5/8/21 12:50 AM	1.21	2.3	
	CSO-002	5/7/21 10:30 PM	5/8/21 12:55 AM	0.55	2.4	
	LEWS 1055	5/7/21 10:35 PM	5/7/21 11:55 PM	0.05	1.3	
	CSO-056B	5/7/21 10:35 PM	5/8/21 12:30 AM	0.41	1.9	
	CSO-056A	5/7/21 10:45 PM	5/8/21 12:20 AM	0.09	1.6	
	LEWS 1130	5/7/21 10:55 PM	5/7/21 11:40 PM	0.02	0.8	
	CSO-059	5/7/21 10:55 PM	5/8/21 12:45 AM	0.14	1.8	
	LEWS 1070	5/7/21 11:20 PM	5/8/21 1:25 AM	0.04	2.1	
	LEWS 1045	5/7/21 11:25 PM	5/8/21 12:25 AM	0.01	1.0	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
17 <sup>1,2</sup>	RRES 1145	5/9/21 8:40 AM	5/9/21 5:50 PM	0.07	9.2	1.12
	LEWS 1040	5/9/21 8:45 AM	5/9/21 8:20 PM	0.82	11.6	
	CSO-052	5/9/21 8:50 AM	5/9/21 7:50 PM	4.97	11.0	
	LEWS 1055	5/9/21 8:55 AM	5/9/21 4:40 PM	0.24	7.8	
	CSO-056B	5/9/21 9:00 AM	5/9/21 7:45 PM	3.10	10.8	
	CSO-002	5/9/21 9:15 AM	5/9/21 10:00 PM	4.37	12.8	
	CSO-056A	5/9/21 9:20 AM	5/9/21 7:00 PM	0.67	9.7	
	LEWS 1070	5/9/21 10:00 AM	5/9/21 10:25 PM	0.35	12.4	
	CSO-055	5/9/21 10:15 AM	5/9/21 2:35 PM	0.14	4.3	
	LEWS 1045	5/9/21 10:15 AM	5/9/21 7:40 PM	0.23	9.4	
	CSO-059	5/9/21 10:20 AM	5/9/21 8:40 PM	2.07	10.3	
	LEWS 1190	5/9/21 10:25 AM	5/9/21 3:35 PM	0.09	5.2	
LEWS 1130	5/9/21 10:40 AM	5/9/21 1:50 PM	0.02	3.2		
18 <sup>2</sup>	CSO-052	5/26/21 11:35 AM	5/26/21 12:00 PM	0.05	0.4	0.12
19 <sup>2</sup>	CSO-052	5/26/21 7:35 PM	5/26/21 8:10 PM	0.10	0.6	0.09
20 <sup>1,2</sup>	RRES 1145	5/28/21 6:05 AM	5/28/21 2:10 PM	0.05	8.1	1.02
	LEWS 1055	5/28/21 6:10 AM	5/28/21 2:00 PM	0.06	7.8	
	LEWS 1040	5/28/21 6:10 AM	5/28/21 2:35 PM	0.50	8.4	
	CSO-056B	5/28/21 6:20 AM	5/28/21 2:45 PM	1.26	8.4	
	CSO-052	5/28/21 6:20 AM	5/28/21 3:00 PM	2.49	8.7	
	CSO-055	5/28/21 6:30 AM	5/28/21 1:50 PM	0.05	7.3	
	CSO-059	5/28/21 6:30 AM	5/28/21 3:10 PM	0.69	8.7	
	CSO-056A	5/28/21 6:40 AM	5/28/21 2:35 PM	0.34	7.9	
	LEWS 1070	5/28/21 7:15 AM	5/28/21 4:05 PM	0.23	8.8	
	LEWS 1045	5/28/21 7:30 AM	5/28/21 2:45 PM	0.08	7.3	
	CSO-002	5/28/21 9:05 AM	5/28/21 2:55 PM	1.40	5.8	
	LEWS 1190	5/28/21 9:15 AM	5/28/21 10:30 AM	0.01	1.3	
21 <sup>1,2</sup>	CSO-055	6/2/21 5:55 PM	6/2/21 6:15 PM	0.02	0.3	0.38
	RRES 1145	6/2/21 5:55 PM	6/2/21 6:30 PM	0.01	0.6	
	CSO-056B	6/2/21 6:00 PM	6/2/21 6:40 PM	0.08	0.7	
	LEWS 1055	6/2/21 6:00 PM	6/2/21 6:45 PM	0.03	0.8	
	LEWS 1040	6/2/21 6:00 PM	6/2/21 7:20 PM	0.07	1.3	
	CSO-056A	6/2/21 6:05 PM	6/2/21 6:40 PM	0.02	0.6	
	CSO-052	6/2/21 6:05 PM	6/2/21 7:45 PM	0.62	1.7	
22 <sup>2</sup>	CSO-052	6/7/21 1:35 PM	6/7/21 2:00 PM	0.04	0.4	0.09

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
23 <sup>1,2</sup>	CSO-055	6/7/21 8:40 PM	6/7/21 9:05 PM	0.06	0.4	0.21
	LEWS 1055	6/7/21 8:40 PM	6/7/21 9:25 PM	0.03	0.8	
	CSO-056B	6/7/21 8:45 PM	6/7/21 9:25 PM	0.14	0.7	
	RRES 1145	6/7/21 8:45 PM	6/7/21 9:25 PM	0.03	0.7	
	LEWS 1040	6/7/21 8:45 PM	6/7/21 9:35 PM	0.05	0.8	
	CSO-052	6/7/21 8:50 PM	6/7/21 10:00 PM	0.50	1.2	
	CSO-056A	6/7/21 8:55 PM	6/7/21 9:25 PM	0.02	0.5	
24 <sup>1,2</sup>	CSO-056B	6/18/21 10:05 AM	6/18/21 10:50 AM	0.05	0.8	0.20
	LEWS 1040	6/18/21 10:05 AM	6/18/21 11:15 AM	0.04	1.2	
	CSO-052	6/18/21 10:20 AM	6/18/21 11:20 AM	0.23	1.0	
25 <sup>1,2</sup>	LEWS 1055	6/20/21 1:20 PM	6/20/21 2:45 PM	0.08	1.4	0.35
	CSO-056A	6/20/21 1:25 PM	6/20/21 3:00 PM	0.08	1.6	
	CSO-056B	6/20/21 1:25 PM	6/20/21 3:00 PM	0.30	1.6	
	LEWS 1040	6/20/21 1:25 PM	6/20/21 3:10 PM	0.16	1.8	
	CSO-059	6/20/21 1:30 PM	6/20/21 3:15 PM	0.09	1.8	
	RRES 1145	6/20/21 1:50 PM	6/20/21 2:40 PM	0.06	0.8	
	CSO-055	6/20/21 1:55 PM	6/20/21 2:25 PM	0.09	0.5	
	CSO-052	6/20/21 2:10 PM	6/20/21 3:10 PM	0.36	1.0	
	LEWS 1070	6/20/21 2:10 PM	6/20/21 3:45 PM	0.03	1.6	
	CSO-002	6/20/21 2:15 PM	6/20/21 3:40 PM	0.12	1.4	
26 <sup>1,2</sup>	CSO-055	6/21/21 5:05 AM	6/21/21 5:25 AM	0.02	0.3	0.24
	CSO-056B	6/21/21 5:05 AM	6/21/21 5:45 AM	0.08	0.7	
	LEWS 1055	6/21/21 5:05 AM	6/21/21 5:45 AM	0.02	0.7	
	RRES 1145	6/21/21 5:05 AM	6/21/21 11:15 AM	0.01	6.2	
	CSO-056A	6/21/21 5:15 AM	6/21/21 5:45 AM	0.02	0.5	
	LEWS 1040	6/21/21 5:15 AM	6/21/21 6:25 AM	0.03	1.2	
	CSO-052	6/21/21 5:20 AM	6/21/21 6:20 AM	0.31	1.0	
27 <sup>1,2</sup>	LEWS 1040	6/25/21 2:30 PM	6/25/21 7:40 PM	0.12	5.2	0.39
	RRES 1145	6/25/21 2:30 PM	6/25/21 8:50 PM	0.02	6.3	
	CSO-056B	6/25/21 2:40 PM	6/25/21 7:15 PM	0.10	4.6	
	CSO-052	6/25/21 2:45 PM	6/25/21 7:50 PM	0.57	5.1	
	CSO-002	6/25/21 3:25 PM	6/25/21 4:35 PM	0.05	1.2	
	LEWS 1070	6/25/21 3:35 PM	6/25/21 4:45 PM	0.01	1.2	
28 <sup>1,2</sup>	LEWS 1040	6/30/21 3:25 PM	6/30/21 4:40 PM	0.04	1.3	0.24
	CSO-056B	6/30/21 3:30 PM	6/30/21 4:10 PM	0.03	0.7	
	CSO-052	6/30/21 3:35 PM	6/30/21 4:45 PM	0.20	1.2	
	CSO-002	6/30/21 4:20 PM	6/30/21 4:50 PM	0.01	0.5	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
29 <sup>1,2</sup>	LEWS 1040	7/8/21 10:15 AM	7/8/21 2:10 PM	0.26	3.9	0.79
	LEWS 1055	7/8/21 10:25 AM	7/8/21 1:30 PM	0.11	3.1	
	CSO-059	7/8/21 10:30 AM	7/8/21 2:20 PM	0.25	3.8	
	RRES 1145	7/8/21 10:40 AM	7/8/21 12:55 PM	0.07	2.3	
	CSO-056B	7/8/21 10:40 AM	7/8/21 1:55 PM	0.67	3.3	
	CSO-052	7/8/21 10:45 AM	7/8/21 2:15 PM	1.68	3.5	
	CSO-055	7/8/21 12:20 PM	7/8/21 12:55 PM	0.09	0.6	
	CSO-056A	7/8/21 12:25 PM	7/8/21 1:55 PM	0.13	1.5	
	LEWS 1070	7/8/21 12:25 PM	7/8/21 2:55 PM	0.07	2.5	
	CSO-002	7/8/21 12:30 PM	7/8/21 2:30 PM	0.23	2.0	
	LEWS 1045	7/8/21 12:40 PM	7/8/21 1:45 PM	0.01	1.1	
30 <sup>1,2</sup>	LEWS 1055	7/11/21 7:45 AM	7/11/21 1:35 PM	0.09	5.8	0.75
	LEWS 1040	7/11/21 7:45 AM	7/11/21 1:55 PM	0.30	6.2	
	RRES 1145	7/11/21 7:50 AM	7/11/21 8:55 AM	0.04	1.1	
	CSO-055	7/11/21 7:50 AM	7/11/21 1:15 PM	0.17	5.4	
	CSO-056B	7/11/21 7:50 AM	7/11/21 2:00 PM	0.49	6.2	
	CSO-056A	7/11/21 8:00 AM	7/11/21 1:55 PM	0.14	5.9	
	CSO-052	7/11/21 8:00 AM	7/11/21 2:15 PM	1.58	6.3	
	CSO-059	7/11/21 8:05 AM	7/11/21 2:25 PM	0.21	6.3	
	LEWS 1070	7/11/21 8:05 AM	7/11/21 3:15 PM	0.09	7.2	
	CSO-002	7/11/21 8:20 AM	7/11/21 2:50 PM	0.39	6.5	
	LEWS 1045	7/11/21 8:25 AM	7/11/21 2:05 PM	0.03	5.7	
31 <sup>1</sup>	LEWS 1040	7/12/21 11:00 AM	7/12/21 5:25 PM	0.13	6.4	0.45
	CSO-052	7/12/21 11:00 AM	7/12/21 5:45 PM	0.98	6.8	
	LEWS 1055	7/12/21 11:10 AM	7/12/21 5:05 PM	0.02	5.9	
	CSO-055	7/12/21 11:15 AM	7/12/21 4:50 PM	0.02	5.6	
	CSO-056B	7/12/21 11:15 AM	7/12/21 5:10 PM	0.16	5.9	
	CSO-056A	7/12/21 11:25 AM	7/12/21 5:10 PM	0.04	5.8	
	CSO-059	7/12/21 11:35 AM	7/12/21 12:40 PM	0.02	1.1	
	CSO-002	7/12/21 11:40 AM	7/12/21 6:00 PM	0.18	6.3	
LEWS 1070	7/12/21 11:50 AM	7/12/21 6:05 PM	0.04	6.3		

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
32 <sup>1,2</sup>	LEWS 1040	7/13/21 6:50 PM	7/13/21 8:25 PM	0.10	1.6	0.27
	LEWS 1055	7/13/21 6:55 PM	7/13/21 7:40 PM	0.03	0.8	
	CSO-055	7/13/21 7:00 PM	7/13/21 7:25 PM	0.01	0.4	
	CSO-056B	7/13/21 7:05 PM	7/13/21 8:20 PM	0.06	1.3	
	CSO-056A	7/13/21 7:10 PM	7/13/21 8:20 PM	0.02	1.2	
	CSO-052	7/13/21 7:10 PM	7/13/21 8:45 PM	0.69	1.6	
	CSO-002	7/13/21 7:50 PM	7/13/21 8:50 PM	0.04	1.0	
	LEWS 1070	7/13/21 8:00 PM	7/13/21 9:10 PM	0.02	1.2	
33 <sup>2</sup>	CSO-052	7/15/21 6:20 PM	7/15/21 6:50 PM	0.08	0.5	0.09
34 <sup>1,2</sup>	LEWS 1040	7/16/21 6:15 PM	7/17/21 10:10 AM	0.73	15.9	1.68
	LEWS 1055	7/16/21 6:15 PM	7/17/21 10:40 AM	0.28	16.4	
	CSO-056B	7/16/21 6:25 PM	7/17/21 11:15 AM	2.07	16.8	
	CSO-052	7/16/21 6:30 PM	7/17/21 12:00 PM	6.33	17.5	
	CSO-056A	7/16/21 6:35 PM	7/17/21 10:55 AM	0.54	16.3	
	LEWS 1070	7/16/21 7:10 PM	7/17/21 2:00 PM	0.50	18.8	
	CSO-055	7/16/21 7:20 PM	7/16/21 10:40 PM	0.05	3.3	
	CSO-002	7/16/21 7:30 PM	7/17/21 1:20 PM	2.19	17.8	
	LEWS 1190	7/16/21 7:35 PM	7/16/21 8:35 PM	0.02	1.0	
	LEWS 1045	7/16/21 7:35 PM	7/17/21 10:50 AM	0.11	15.3	
	CSO-059	7/16/21 7:35 PM	7/17/21 12:20 PM	1.88	16.8	
	CSO-055	7/17/21 5:40 AM	7/17/21 9:25 AM	0.12	3.8	
	LEWS 1190	7/17/21 5:45 AM	7/17/21 9:45 AM	0.04	4.0	
	RRES 1145	7/17/21 5:50 AM	7/17/21 9:35 AM	0.01	3.8	
35 <sup>2</sup>	CSO-052	7/24/21 4:40 AM	7/24/21 5:00 AM	0.03	0.3	0.10
36 <sup>1</sup>	LEWS 1040	7/29/21 11:10 PM	7/29/21 11:40 PM	0.02	0.5	0.07
37 <sup>1,2</sup>	LEWS 1040	8/1/21 10:05 AM	8/1/21 11:05 AM	0.09	1.0	0.41
	LEWS 1055	8/1/21 10:10 AM	8/1/21 11:00 AM	0.05	0.8	
	RRES 1145	8/1/21 10:20 AM	8/1/21 10:55 AM	0.02	0.6	
	CSO-056A	8/1/21 10:20 AM	8/1/21 11:00 AM	0.03	0.7	
	CSO-052	8/1/21 10:25 AM	8/1/21 12:00 PM	1.01	1.6	



**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
38 <sup>1,2</sup>	LEWS 1040	8/7/21 5:15 PM	8/7/21 6:40 PM	0.20	1.4	0.55
	RRES 1145	8/7/21 5:25 PM	8/7/21 5:55 PM	0.03	0.5	
	LEWS 1055	8/7/21 5:25 PM	8/7/21 6:30 PM	0.09	1.1	
	CSO-055	8/7/21 5:30 PM	8/7/21 6:00 PM	0.05	0.5	
	CSO-056B	8/7/21 5:30 PM	8/7/21 6:35 PM	0.17	1.1	
	CSO-056A	8/7/21 5:35 PM	8/7/21 6:40 PM	0.04	1.1	
	CSO-059	8/7/21 5:35 PM	8/7/21 7:00 PM	0.05	1.4	
	CSO-052	8/7/21 5:35 PM	8/7/21 7:10 PM	1.24	1.6	
	LEWS 1070	8/7/21 5:40 PM	8/7/21 7:30 PM	0.03	1.8	
	CSO-002	8/7/21 5:55 PM	8/7/21 7:05 PM	0.09	1.2	
39 <sup>1,2</sup>	CSO-055	8/8/21 10:05 AM	8/8/21 11:05 AM	0.28	1.0	0.83
	LEWS 1040	8/8/21 10:05 AM	8/8/21 1:15 PM	0.71	3.2	
	CSO-056B	8/8/21 10:10 AM	8/8/21 11:55 AM	0.67	1.8	
	LEWS 1055	8/8/21 10:10 AM	8/8/21 12:05 PM	0.50	1.9	
	CSO-056A	8/8/21 10:15 AM	8/8/21 12:05 PM	0.13	1.8	
	RRES 1145	8/8/21 10:20 AM	8/8/21 11:35 AM	0.09	1.3	
	CSO-059	8/8/21 10:20 AM	8/8/21 1:05 PM	0.76	2.8	
	LEWS 1070	8/8/21 10:20 AM	8/8/21 2:05 PM	0.11	3.8	
	LEWS 1220	8/8/21 10:25 AM	8/8/21 10:45 AM	0.02	0.3	
	CSO-058	8/8/21 10:25 AM	8/8/21 11:05 AM	0.03	0.7	
	LEWS 1190	8/8/21 10:30 AM	8/8/21 11:25 AM	0.03	0.9	
	CSO-052	8/8/21 10:30 AM	8/8/21 1:15 PM	2.24	2.8	
	CSO-002	8/8/21 10:35 AM	8/8/21 1:05 PM	0.02	2.5	
	LEWS 1045	8/8/21 11:10 AM	8/8/21 12:30 PM	0.02	1.3	
40 <sup>1,2</sup>	LEWS 1040	8/10/21 3:05 AM	8/10/21 4:10 AM	0.05	1.1	0.25
	CSO-052	8/10/21 3:20 AM	8/10/21 4:55 AM	0.56	1.6	
41 <sup>1,2</sup>	LEWS 1040	8/11/21 3:55 PM	8/11/21 5:45 PM	0.14	1.8	0.46
	LEWS 1055	8/11/21 4:10 PM	8/11/21 5:10 PM	0.09	1.0	
	CSO-055	8/11/21 4:15 PM	8/11/21 4:50 PM	0.13	0.6	
	RRES 1145	8/11/21 4:15 PM	8/11/21 4:50 PM	0.07	0.6	
	CSO-056A	8/11/21 4:20 PM	8/11/21 5:30 PM	0.07	1.2	
	CSO-059	8/11/21 4:20 PM	8/11/21 6:00 PM	0.09	1.7	
	LEWS 1070	8/11/21 4:20 PM	8/11/21 6:45 PM	0.04	2.4	
	CSO-052	8/11/21 4:25 PM	8/11/21 6:50 PM	1.16	2.4	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
42 <sup>1,2</sup>	LEWS 1055	8/12/21 4:30 AM	8/12/21 9:55 AM	0.11	5.4	0.53
	LEWS 1040	8/12/21 7:00 AM	8/12/21 11:10 AM	0.24	4.2	
	CSO-055	8/12/21 7:05 AM	8/12/21 8:45 AM	0.18	1.7	
	RRES 1145	8/12/21 7:10 AM	8/12/21 9:00 AM	0.03	1.8	
	CSO-056B	8/12/21 7:10 AM	8/12/21 9:55 AM	0.08	2.8	
	CSO-056A	8/12/21 7:15 AM	8/12/21 9:55 AM	0.10	2.7	
	CSO-052	8/12/21 7:20 AM	8/12/21 10:35 AM	1.49	3.3	
	CSO-059	8/12/21 7:20 AM	8/12/21 10:40 AM	0.50	3.3	
	LEWS 1045	8/12/21 7:45 AM	8/12/21 10:25 AM	0.06	2.7	
	LEWS 1070	8/12/21 7:45 AM	8/12/21 11:30 AM	0.10	3.8	
	LEWS 1190	8/12/21 8:05 AM	8/12/21 8:45 AM	0.01	0.7	
43 <sup>1,2</sup>	LEWS 1040	8/13/21 5:35 PM	8/14/21 12:00 AM	0.78	6.4	1.07
	CSO-055	8/13/21 5:45 PM	8/13/21 7:00 PM	0.36	1.3	
	RRES 1145	8/13/21 5:45 PM	8/13/21 7:05 PM	0.18	1.3	
	LEWS 1055	8/13/21 5:45 PM	8/13/21 8:20 PM	0.45	2.6	
	CSO-056B	8/13/21 5:50 PM	8/13/21 8:20 PM	0.63	2.5	
	CSO-052	8/13/21 5:50 PM	8/13/21 9:45 PM	4.03	3.9	
	RRES 1180	8/13/21 5:55 PM	8/13/21 6:30 PM	0.04	0.6	
	LEWS 1070	8/13/21 5:55 PM	8/13/21 11:45 PM	0.16	5.8	
	CSO-058	8/13/21 6:00 PM	8/13/21 6:45 PM	0.03	0.8	
	CSO-059	8/13/21 6:00 PM	8/13/21 10:05 PM	1.15	4.1	
	LEWS 1190	8/13/21 6:05 PM	8/13/21 7:25 PM	0.05	1.3	
	CSO-002	8/13/21 6:05 PM	8/13/21 10:45 PM	0.03	4.7	
	LEWS 1045	8/13/21 6:55 PM	8/13/21 9:10 PM	0.05	2.3	
	CSO-056A	8/13/21 7:00 PM	8/13/21 8:40 PM	0.06	1.7	
44 <sup>1,2</sup>	LEWS 1040	8/25/21 7:10 AM	8/25/21 2:25 PM	0.02	7.3	0.32
	CSO-052	8/25/21 1:40 PM	8/25/21 2:40 PM	0.15	1.0	
45 <sup>1,2</sup>	LEWS 1040	8/29/21 12:25 PM	8/29/21 2:50 PM	0.10	2.4	0.39
	LEWS 1055	8/29/21 12:30 PM	8/29/21 2:35 PM	0.08	2.1	
	CSO-055	8/29/21 12:35 PM	8/29/21 1:05 PM	0.06	0.5	
	RRES 1145	8/29/21 12:35 PM	8/29/21 2:45 PM	0.01	2.2	
	CSO-056A	8/29/21 12:45 PM	8/29/21 1:10 PM	0.02	0.4	
	CSO-052	8/29/21 12:45 PM	8/29/21 3:15 PM	0.34	2.5	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
46 <sup>1,2</sup>	CSO-055	8/29/21 9:35 PM	8/29/21 10:00 PM	0.07	0.4	0.32
	LEWS 1055	8/29/21 9:35 PM	8/30/21 4:50 AM	0.06	7.3	
	CSO-056A	8/29/21 9:40 PM	8/30/21 4:45 AM	0.04	7.1	
	LEWS 1040	8/29/21 10:00 PM	8/30/21 4:50 AM	0.05	6.8	
	CSO-052	8/29/21 10:20 PM	8/30/21 5:05 AM	0.30	6.8	
	CSO-055	8/30/21 4:05 AM	8/30/21 4:35 AM	0.05	0.5	
47 <sup>1,2</sup>	LEWS 1055	9/14/21 10:50 PM	9/15/21 12:45 AM	0.14	1.9	0.67
	LEWS 1040	9/14/21 10:50 PM	9/15/21 1:20 AM	0.28	2.5	
	CSO-059	9/14/21 11:00 PM	9/15/21 1:25 AM	0.35	2.4	
	CSO-002	9/14/21 11:10 PM	9/15/21 1:05 AM	0.52	1.9	
	CSO-052	9/14/21 11:15 PM	9/15/21 1:25 AM	1.54	2.2	
	CSO-056A	9/14/21 11:20 PM	9/15/21 1:20 AM	0.10	2.0	
	RRES 1145	9/14/21 11:30 PM	9/15/21 12:20 AM	0.06	0.8	
	LEWS 1130	9/14/21 11:35 PM	9/15/21 12:15 AM	0.01	0.7	
	CSO-055	9/14/21 11:35 PM	9/15/21 12:25 AM	0.13	0.8	
	LEWS 1070	9/14/21 11:45 PM	9/15/21 1:55 AM	0.05	2.2	
	LEWS 1045	9/14/21 11:50 PM	9/15/21 1:05 AM	0.02	1.3	
	CSO-056B	9/14/21 11:55 PM	9/15/21 12:50 AM	0.06	0.9	
LEWS 1190	9/15/21 12:00 AM	9/15/21 12:30 AM	0.01	0.5		
48 <sup>1,2</sup>	CSO-055	9/22/21 5:15 AM	9/22/21 3:40 PM	0.32	10.4	1.76
	LEWS 1055	9/22/21 5:15 AM	9/22/21 4:45 PM	0.35	11.5	
	RRES 1145	9/22/21 5:25 AM	9/22/21 4:45 PM	0.05	11.3	
	LEWS 1040	9/22/21 5:25 AM	9/22/21 8:50 PM	0.73	15.4	
	CSO-059	9/22/21 5:30 AM	9/22/21 6:40 PM	2.14	13.2	
	CSO-052	9/22/21 5:40 AM	9/22/21 6:20 PM	5.01	12.7	
	CSO-002	9/22/21 6:10 AM	9/22/21 9:10 PM	4.46	15.0	
	LEWS 1070	9/22/21 6:45 AM	9/22/21 8:00 PM	0.35	13.3	
	LEWS 1045	9/22/21 7:05 AM	9/22/21 6:05 PM	0.22	11.0	
	CSO-056B	9/22/21 7:15 AM	9/22/21 5:00 PM	0.32	9.8	
	LEWS 1130	9/22/21 9:15 AM	9/22/21 3:40 PM	0.02	6.4	
	LEWS 1190	9/22/21 12:00 PM	9/22/21 3:50 PM	0.07	3.8	
	CSO-056A	9/22/21 12:00 PM	9/22/21 4:00 PM	0.21	4.0	
49 <sup>1,2</sup>	CSO-055	10/3/21 2:00 AM	10/3/21 2:20 AM	0.02	0.3	0.20
	CSO-056B	10/3/21 2:00 AM	10/3/21 2:30 AM	0.04	0.5	
	LEWS 1040	10/3/21 2:00 AM	10/3/21 2:35 AM	0.01	0.6	
	CSO-052	10/3/21 2:15 AM	10/3/21 2:55 AM	0.13	0.7	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
50 <sup>1,2</sup>	LEWS 1040	10/7/21 3:20 PM	10/7/21 7:15 PM	1.60	3.9	1.16
	RRES 1145	10/7/21 3:25 PM	10/7/21 5:20 PM	0.61	1.9	
	LEWS 1055	10/7/21 3:25 PM	10/7/21 5:45 PM	0.61	2.3	
	CSO-055	10/7/21 3:30 PM	10/7/21 4:55 PM	0.43	1.4	
	CSO-056B	10/7/21 3:30 PM	10/7/21 6:40 PM	2.06	3.2	
	RRES 1180	10/7/21 3:35 PM	10/7/21 4:00 PM	0.03	0.4	
	CSO-056A	10/7/21 3:35 PM	10/7/21 6:25 PM	0.48	2.8	
	CSO-052	10/7/21 3:35 PM	10/7/21 6:40 PM	2.88	3.1	
	CSO-059	10/7/21 3:35 PM	10/7/21 7:00 PM	0.98	3.4	
	LEWS 1070	10/7/21 3:35 PM	10/7/21 8:00 PM	0.14	4.4	
	LEWS 1220	10/7/21 3:40 PM	10/7/21 4:20 PM	0.01	0.7	
	LEWS 1190	10/7/21 3:45 PM	10/7/21 5:15 PM	0.06	1.5	
	CSO-002	10/7/21 3:50 PM	10/7/21 7:45 PM	0.02	3.9	
	LEWS 1180	10/7/21 4:20 PM	10/7/21 4:30 PM	0.04	0.2	
CSO-057	10/7/21 4:45 PM	10/7/21 6:05 PM	0.05	1.3		
51 <sup>1,2</sup>	RRES 1145	10/8/21 5:50 PM	10/8/21 6:25 PM	0.05	0.6	0.63
	LEWS 1040	10/8/21 5:50 PM	10/8/21 7:00 PM	0.36	1.2	
	CSO-055	10/8/21 6:05 PM	10/8/21 6:30 PM	0.07	0.4	
	LEWS 1055	10/8/21 6:05 PM	10/8/21 6:40 PM	0.05	0.6	
	CSO-056B	10/8/21 6:05 PM	10/8/21 7:05 PM	0.13	1.0	
	CSO-052	10/8/21 6:05 PM	10/8/21 7:35 PM	0.64	1.5	
	CSO-056A	10/8/21 6:10 PM	10/8/21 7:05 PM	0.04	0.9	
	CSO-059	10/8/21 6:30 PM	10/8/21 7:35 PM	0.05	1.1	
	LEWS 1070	10/8/21 6:35 PM	10/8/21 8:15 PM	0.03	1.7	
52 <sup>1,2</sup>	CSO-055	10/15/21 7:30 PM	10/15/21 8:10 PM	0.13	0.7	0.45
	LEWS 1040	10/15/21 7:30 PM	10/15/21 8:25 PM	0.24	0.9	
	LEWS 1055	10/15/21 7:30 PM	10/15/21 8:30 PM	0.13	1.0	
	RRES 1145	10/15/21 7:35 PM	10/15/21 8:05 PM	0.09	0.5	
	CSO-056B	10/15/21 7:35 PM	10/15/21 8:50 PM	0.52	1.3	
	CSO-056A	10/15/21 7:40 PM	10/15/21 8:50 PM	0.12	1.2	
	CSO-059	10/15/21 7:40 PM	10/15/21 9:10 PM	0.09	1.5	
	CSO-002	10/15/21 7:40 PM	10/15/21 9:45 PM	0.15	2.1	
	LEWS 1070	10/15/21 7:40 PM	10/15/21 9:45 PM	0.05	2.1	
	CSO-052	10/15/21 7:45 PM	10/15/21 8:55 PM	0.65	1.2	
53 <sup>1,2</sup>	LEWS 1040	10/16/21 7:10 PM	10/17/21 4:10 AM	0.02	9.0	0.35
	CSO-052	10/16/21 7:15 PM	10/17/21 4:40 AM	1.06	9.4	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
54 <sup>1,2</sup>	CSO-056B	10/21/21 10:00 AM	10/21/21 10:25 AM	0.03	0.4	0.17
	LEWS 1040	10/21/21 10:00 AM	10/21/21 10:30 AM	0.01	0.5	
	CSO-052	10/21/21 10:15 AM	10/21/21 11:00 AM	0.20	0.8	
55 <sup>1,2</sup>	CSO-056B	10/22/21 12:40 AM	10/22/21 1:10 AM	0.02	0.5	0.11
	CSO-052	10/22/21 1:05 AM	10/22/21 1:45 AM	0.11	0.7	
56 <sup>1,2</sup>	LEWS 1040	10/24/21 2:35 PM	10/25/21 1:40 AM	0.49	11.1	1.05
	CSO-052	10/24/21 2:40 PM	10/25/21 1:20 AM	2.96	10.7	
	CSO-002	10/24/21 4:50 PM	10/25/21 5:10 AM	0.74	12.3	
	CSO-055	10/24/21 6:05 PM	10/24/21 11:30 PM	0.20	5.4	
	CSO-056B	10/24/21 6:10 PM	10/25/21 12:55 AM	1.05	6.8	
	CSO-059	10/24/21 6:15 PM	10/25/21 1:55 AM	0.88	7.7	
	CSO-056A	10/24/21 6:50 PM	10/25/21 12:45 AM	0.27	5.9	
	LEWS 1070	10/24/21 6:50 PM	10/25/21 3:40 AM	0.19	8.8	
	LEWS 1055	10/24/21 9:10 PM	10/25/21 12:05 AM	0.20	2.9	
	RRES 1145	10/24/21 9:15 PM	10/24/21 11:10 PM	0.01	1.9	
	LEWS 1045	10/24/21 9:40 PM	10/25/21 1:15 AM	0.11	3.6	
57 <sup>1,2</sup>	LEWS 1040	10/25/21 4:25 PM	10/26/21 1:00 AM	0.17	8.6	0.48
	LEWS 1055	10/25/21 4:30 PM	10/25/21 5:45 PM	0.05	1.3	
	CSO-056B	10/25/21 4:35 PM	10/25/21 6:35 PM	0.18	2.0	
	CSO-055	10/25/21 4:40 PM	10/25/21 5:15 PM	0.03	0.6	
	CSO-052	10/25/21 4:40 PM	10/26/21 1:20 AM	1.83	8.7	
	CSO-056A	10/25/21 4:45 PM	10/25/21 6:25 PM	0.04	1.7	
	LEWS 1070	10/25/21 5:10 PM	10/26/21 2:00 AM	0.12	8.8	
	CSO-002	10/25/21 5:20 PM	10/26/21 2:40 AM	0.76	9.3	
CSO-059	10/25/21 5:25 PM	10/25/21 7:10 PM	0.08	1.8		
58 <sup>1,2</sup>	LEWS 1040	10/28/21 10:55 PM	10/29/21 1:25 PM	0.05	14.5	0.55
	CSO-052	10/28/21 11:20 PM	10/29/21 1:50 PM	0.79	14.5	
	CSO-002	10/29/21 7:20 AM	10/29/21 9:40 AM	0.18	2.3	
	CSO-056B	10/29/21 7:25 AM	10/29/21 8:20 AM	0.04	0.9	
	LEWS 1070	10/29/21 7:40 AM	10/29/21 9:35 AM	0.04	1.9	
	CSO-059	10/29/21 7:55 AM	10/29/21 8:50 AM	0.02	0.9	
59 <sup>1,2</sup>	LEWS 1040	10/30/21 9:00 PM	10/31/21 1:35 AM	0.02	4.6	0.26
	CSO-052	10/30/21 9:00 PM	10/31/21 2:05 AM	0.49	5.1	

**Table 2 (continued)**  
**Wet Weather Events Producing CSOs**

<b>Event</b>	<b>Outfall</b>	<b>Event Start</b>	<b>Event End</b>	<b>Total Volume (MG)</b>	<b>Duration (Hrs)</b>	<b>Total Rain (in)</b>
60 <sup>1,2</sup>	LEWS 1040	11/11/21 8:35 PM	11/11/21 11:30 PM	0.06	2.9	0.34
	CSO-052	11/11/21 8:50 PM	11/11/21 11:50 PM	0.57	3.0	
	CSO-002	11/11/21 9:55 PM	11/12/21 12:10 AM	0.20	2.3	
	CSO-056B	11/11/21 10:10 PM	11/11/21 11:20 PM	0.05	1.2	
	LEWS 1070	11/11/21 10:20 PM	11/12/21 12:25 AM	0.04	2.1	
	CSO-056A	11/11/21 10:25 PM	11/11/21 11:15 PM	0.01	0.8	
	CSO-059	11/11/21 10:40 PM	11/11/21 11:40 PM	0.03	1.0	
61 <sup>2</sup>	CSO-052	11/18/21 3:35 AM	11/18/21 4:05 AM	0.04	0.5	0.23
62 <sup>1,2</sup>	CSO-055	11/25/21 7:35 PM	11/25/21 8:10 PM	0.01	0.6	0.26
	CSO-056B	11/25/21 7:35 PM	11/25/21 9:10 PM	0.06	1.6	
	LEWS 1040	11/25/21 7:35 PM	11/25/21 9:20 PM	0.07	1.8	
	CSO-052	11/25/21 7:45 PM	11/25/21 9:35 PM	0.45	1.8	
	CSO-002	11/25/21 8:05 PM	11/25/21 10:10 PM	0.15	2.1	
	LEWS 1070	11/25/21 8:25 PM	11/25/21 10:15 PM	0.03	1.8	
63 <sup>1,2</sup>	CSO-052	12/6/21 4:10 AM	12/6/21 8:30 AM	0.04	4.3	0.38
	LEWS 1040	12/6/21 4:30 AM	12/6/21 8:20 AM	0.12	3.8	
	CSO-056B	12/6/21 4:45 AM	12/6/21 8:15 AM	0.18	3.5	
	CSO-055	12/6/21 4:55 AM	12/6/21 8:15 AM	0.01	3.3	
	CSO-056A	12/6/21 5:00 AM	12/6/21 6:25 AM	0.05	1.4	
	CSO-002	12/6/21 5:00 AM	12/6/21 9:05 AM	0.28	4.1	
	LEWS 1070	12/6/21 5:30 AM	12/6/21 8:55 AM	0.04	3.4	
	CSO-059	12/6/21 5:40 AM	12/6/21 6:45 AM	0.07	1.1	
64 <sup>1,2</sup>	LEWS 1055	12/11/21 3:00 AM	12/11/21 7:10 AM	0.04	4.2	0.57
	CSO-052	12/11/21 3:00 AM	12/11/21 7:40 AM	0.06	4.7	
	CSO-055	12/11/21 3:05 AM	12/11/21 7:10 AM	0.10	4.1	
	CSO-056B	12/11/21 3:05 AM	12/11/21 7:55 AM	0.58	4.8	
	LEWS 1040	12/11/21 3:05 AM	12/11/21 8:10 AM	0.32	5.1	
	RRES 1145	12/11/21 3:10 AM	12/11/21 7:10 AM	0.04	4.0	
	CSO-056A	12/11/21 3:20 AM	12/11/21 7:50 AM	0.20	4.5	
	CSO-002	12/11/21 4:50 AM	12/11/21 9:20 AM	0.67	4.5	
	CSO-059	12/11/21 4:55 AM	12/11/21 8:20 AM	0.50	3.4	
	LEWS 1070	12/11/21 4:55 AM	12/11/21 10:00 AM	0.12	5.1	
	LEWS 1045	12/11/21 5:20 AM	12/11/21 7:50 AM	0.06	2.5	
65 <sup>1</sup>	LEWS 1040	12/18/21 7:10 AM	12/18/21 4:45 PM	0.01	9.6	0.39
66 <sup>1,2</sup>	LEWS 1040	12/25/21 3:55 AM	12/25/21 4:40 AM	0.03	0.8	0.26
	CSO-002	12/25/21 4:45 AM	12/25/21 6:45 AM	0.12	2.0	

Table 2 (continued)						
Wet Weather Events Producing CSOs						
Event	Outfall	Event Start	Event End	Total Volume (MG)	Duration (Hrs)	Total Rain (in)
67 <sup>1</sup>	LEWS 1040	12/27/21 5:30 AM	12/27/21 6:50 AM	0.03	1.3	0.17
	CSO-056B	12/27/21 6:10 AM	12/27/21 6:40 AM	0.02	0.5	
68 <sup>1</sup>	LEWS 1040	12/28/21 4:45 PM	12/28/21 7:10 PM	0.06	2.4	0.26
	CSO-056B	12/28/21 5:25 PM	12/28/21 7:05 PM	0.06	1.7	
	CSO-002	12/28/21 5:55 PM	12/28/21 8:15 PM	0.19	2.3	
	LEWS 1070	12/28/21 6:15 PM	12/28/21 8:05 PM	0.03	1.8	
	CSO-059	12/28/21 6:35 PM	12/28/21 7:20 PM	0.02	0.8	

Notes:

<sup>1</sup> Clifton Beach and Edgewater Beach (both Bathing Waters) – potentially impacted public access area  
<sup>2</sup> Rocky River (Primary Contact Recreation) and Rocky River Marina – potentially impacted public access area  
<sup>3</sup> CSO on 02/24/2021 was due to snow melt (temperature rose to 57<sup>0</sup> F. after two days of snow)

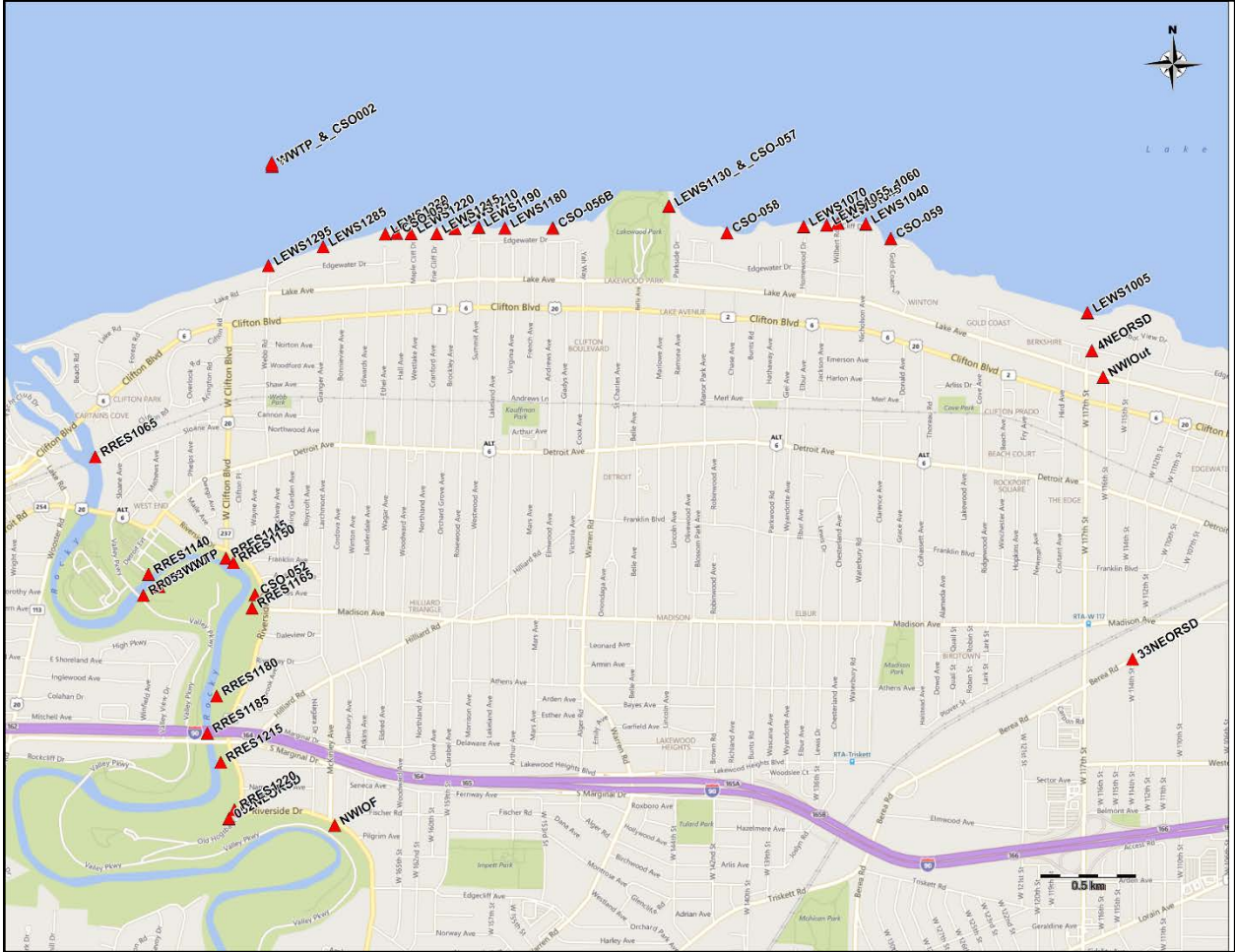


Figure 1: Map of the CSO Outfalls

The City of Lakewood has an Integrated Wet Weather Improvement Plan (IWWIP) that will reduce combined sewer overflow events to four or less in a typical year of rainfall. The City submitted the IWWIP to the EPA on March 1, 2019, and currently incorporates:

- 1) the installation of a high rate treatment (HRT) facility for CSO-002 (substantially completed in March 2022 and is currently in the start-up and commissioning phase);
- 2) combined sewer overflow storage tank project for CSO-052 (preliminary design started in 2021) which would discharge to the WWTP once the plant has recovered from the rain event;
- 3) sewer separation projects that reduce infiltration to the sewers at both the public and private levels;
- 4) combined sewer overflow storage tank project for CSO-059 (conceptual drawings and discussion started in 2021) which would discharge back to the Edgewater Interceptor Sewer once its water level has receded after a rain event; and,
- 5) increasing permeable surfaces where appropriate. The City's IWWIP is continually progressing.

For more information, contact:

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## **COMPLIANCE WITH EPA'S NINE MINIMUM CONTROLS**

The City of Lakewood operates and maintains its collection system in accordance with the U.S. EPA's 1994 nine minimum controls (*Federal Register / Vol.59, No.75 / Tuesday, April 19, 1994 / Notices* Section II B. page 18691). A brief description of the controls and Lakewood's activities for this reporting year follows:

### **Control 1—Reducing CSOs through Operation and Maintenance**

Lakewood continued to implement its operation and maintenance program for the combined sewer collection system, including cleaning and televising sewer mains, catch basins and manholes. In 2021, Lakewood cleaned and televised the Interceptor sewer and found twenty-five (25) small holes and voids. These defects were patched and plans are being prepared to line the interceptor to prevent further deterioration.

### **Control 2—Storing CSOs in Collection System**

To maximize as much sewage storage as possible in the collection system, the interceptor is filled prior to any CSO discharge to the greatest extent possible. This is routinely done in order to reduce the magnitude, frequency, and duration of CSOs. In 2019, Lakewood modified several overflow structures within the collection system (raised weirs, etc.) to store more flow within in the pipes before an overflow occurs. The data for 2021 demonstrates a reduction in overflow number and volume. In 2021, Lakewood made plans to raise a weir to reduce overflows at RRES1180 to further store combined sewage in the collection system.

### **Control 3—Optimizing Pretreatment Program**

Lakewood monitored the industrial pretreatment discharges. This was done to minimize CSO pollutants from the discharges of non-domestic users.

### **Control 4—Maximizing Flow through the Treatment Plant**

Lakewood continued to operate the WWTP at its maximum treatable flow rate during wet weather flow conditions. This is routinely done to reduce the magnitude, frequency, and duration of CSOs. In 2021, Lakewood substantially completed the High Rate Treatment (HRT) facility at the WWTP. The HRT will reduce CSOs at CSO-002 to four or less in a typical year.

### **Control 5—Preventing Dry-Weather Overflows**

There were no dry weather overflows at Lakewood's CSO outfalls during this reporting year.

### **Control 6—Controlling Solids and Floatables**

Lakewood maintains street sweeping from March – November every year as well as catch basin and sewer main cleaning. Volume over the past year of debris collected was 1,400 cubic yards.

### **Control 7—Preventing Pollution of Receiving Water Bodies**

To reduce the impact of CSOs, the first flush during the CSO event is routed to additional treatment capacity at the plant. The City also implements sewer improvement projects as a part of most public works improvements projects. These sewer improvement components include manhole separation and CIPP sewer lining where necessary to reduce flow communication between "over" and "under" sewers. The City's "under" sewers route to the WWTP, whereas the "over" sewers generally route to receiving waters.

### **Control 8—Notifying the Public**

In 2021, the public notification process was continued to inform the EPA, Cuyahoga County Board of Health and interested citizens when CSOs occur. CSO's are publicly reported here: <https://cso.lakewoodoh.gov/>.

### **Control 9—Monitoring CSO Outfalls to Confirm the Effectiveness of CSO Controls**

Lakewood continued to monitor the CSO outfalls to characterize CSO discharges. Monitoring included metering the volume of the CSO discharge, visually inspecting the overflow for floatables, and sampling the initial overflow for pollutant concentrations.