



CITY OF CHELSEA, MA
Department of Public Works

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National Pollutant Discharge
Elimination System
Permit No. MA 0101877

City of Chelsea
Massachusetts
Combined Sewer Overflow
Calendar Year 2021
Annual Report

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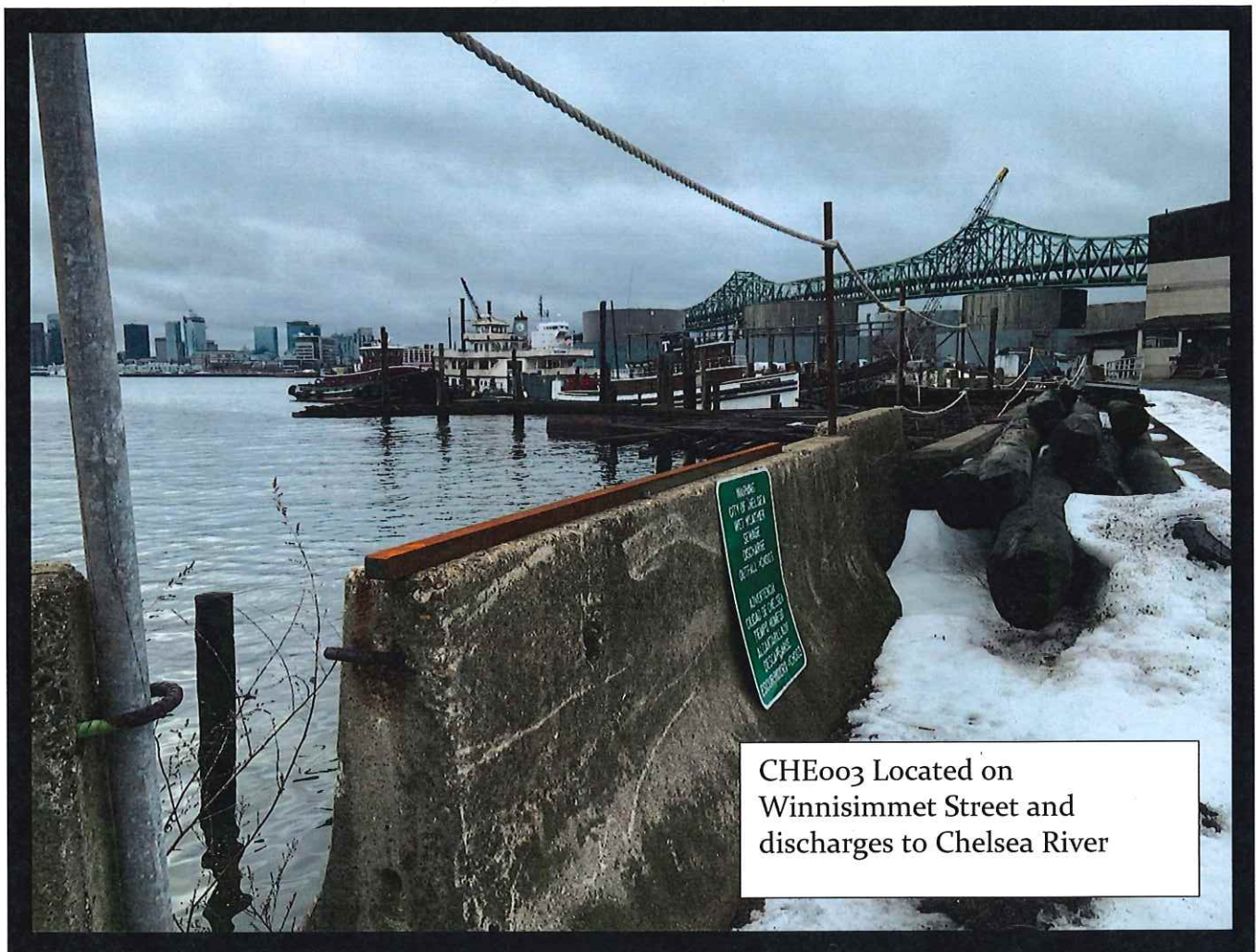
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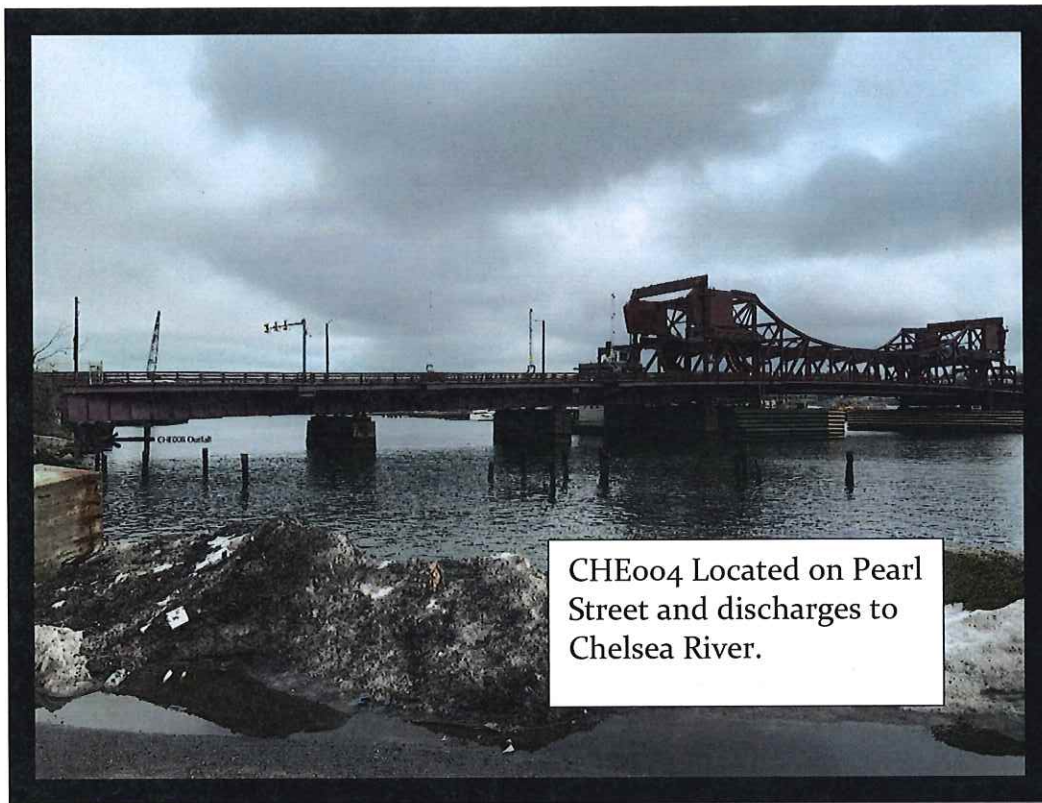
Overview

Under jurisdiction of the National Pollutant Discharge Elimination System (NPDES) program, the U.S. Environmental Protection Agency (EPA) issued permit No. MA0101877 to the City of Chelsea, Massachusetts on April 11, 2003. The latest re-issuance of this permit became effective February 1, 2014. In accordance with the permit, the requirements of the Clean Water Act, and the requirements of the Massachusetts Clean Water Act, the City of Chelsea is authorized to discharge from four Combined Sewer Overflows (CSO's) as follows:

- CHE002 Located on Broadway and discharges to Boston Inner Harbor – closed in 2014



CHE003 Located on
Winnisimmet Street and
discharges to Chelsea River



CHE008 Located on Eastern Avenue and discharges to Chelsea River.





A map indicating the location of each of these CSO's was previously provided. It should be noted that Chelsea permanently closed CHE002 on December 4, 2014. In accordance with part 1.F of the permit, Chelsea sent Notice of Elimination to regulatory agencies and stakeholders on December 4, 2014; however, a formal permit modification has not yet been received.

Part 1.D of the NPDES permit requires that a report be submitted by April 30th, and this report was prepared to fulfill that requirement.

Public Notification

Notifications are sent to a group of stakeholders within 24 Hours of an activation. These notifications include estimated volumes when available.

Chelsea WSD posts all CSO activations to its web page as soon as practicable.

<https://www.chelseama.gov/public-works/pages/combined-sewer-overflows>

Activation Frequency and Discharge Volume

Chelsea installed continuous CSO metering equipment in July of 2003. In November of 2014 Flow Assessment Services [FAS] recommended equipment upgrades to the system. This equipment was purchased by the City of Chelsea and installed by FAS. In July of 2020 The City of Chelsea took over operation of the water/sewer department including the collection system. Chelsea's water/ sewer department had been under contract operations since 1994. All CSO monitoring equipment is now leased to the City and maintained by FAS.

In accordance with the NPDES permit, the discharge volume and duration for each of the CSO activations recorded in 2021 is provided in Appendix A.

To summarize:

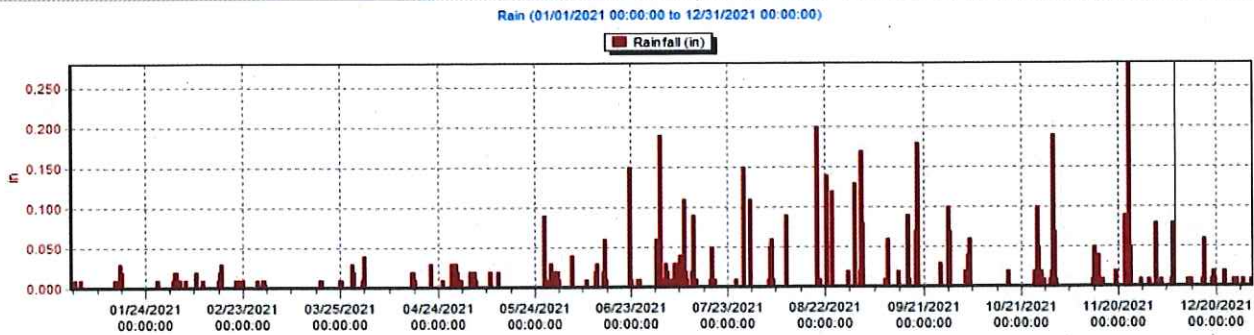
- CHE003 did not activate in 2021
- CHE004 activated 4 times with a total volume of 924,798 gallons
- CHE008 activated 16 times with a total volume of 5,409,643 gallons

Chelsea continues to work with the Massachusetts Water Resources Authority [MWRA] on all CSO related activities. Comparison of CSO activation data from city flow meters as well as Chelsea's hydraulic model with MWRA's measurements and hydraulic model predictions is ongoing. Please see the MWRA's Annual CSO Report for details.

Precipitation during the Calendar Year

Chelsea records precipitation data continuously with a rainfall gauge at the Chelsea City Yard, located at 380 Beacham Street. The total amount recorded for the year was 46.01", making 2021 one of the wettest years in recent history.

In accordance with the NPDES permit, total rainfall, peak intensity, and average intensity between January 1, 2021 and December 31, 2021 are provided in Appendix B.



Month	Total # of Rainfall Events	Total Rainfall (Inches)	Highest Peak Hourly Rainfall (Inches)	Highest Peak Interval Rain	# of Activations CHEo04	#of Activations CHEo8
January	6	0.71	0.09	0.03	0	0
February	12	1.3	0.13	0.03	0	0
March	5	0.6	0.09	0.03	0	1
April	7	2.3	0.21	0.04	0	0
May	10	4.1	0.26	0.09	0	0
June	9	3.0	0.90	0.15	1	1
July	19	9.9	1.28	0.19	1	6
August	10	6.5	1.07	0.20	2	4
September	11	7.7	1.14	0.18	1	4
October	10	6.3	0.62	0.19	0	0
November	8	1.8	0.28	0.28	0	0
December	15	1.8	0.13	0.08	0	0
Totals	122	46.01	Highest for year 1.28	Highest for year 0.28		

Status of Implementation of Work

Chelsea is aggressively pursuing sewer separation and other infrastructure improvement projects, including green infrastructure that will reduce the quantity of stormwater entering its combined sewer system and, therefore, CSO activation, frequency and volume. The finalized master plan for sewer separation serves as a guide as we move forward. This includes a hydraulic model for the sewer and drain systems.

Plans are underway for water, sewer, drain and roadway improvements on portions of Central Avenue, from Willow Street and Watts Street. The utilities in this area are in need of upgrade, particularly the brick combined gravity main. Upsizing and redirecting the storm drain flow will reduce the amount of runoff in this area.

Throughout 2021 work was ongoing on the Upper Broadway construction project. It is substantially complete as of Jan. 2022. The project started at Chelsea City Hall and progressed towards the Revere City line. The project's objective was to upgrade the water and sewer main's where applicable, as well as transferring the associated service lines. Additionally, in a continuous effort to separate the storm water from the sewer line, roof drain and sump



pump connections are disconnected from the sewer line and redirected into newly installed underdrain or above ground discharge depending on the location. Water, sewer, and underdrain work has been completed on Upper Broadway.

The team performing this is comprised of the city's hired contractor, Aqualine, along with management oversight by Weston and Sampson. Chelsea WSD assists Aqualine in performing water shutdowns to complete new hydrant installs and gate valve tie-ins.

In 2021, design of utility was on-going for the following areas of Chelsea:

- Central Avenue (Highland Street to Marginal Street)
- Watts Street (Highland Street to Willow Street)
- Watts Street (Dead End to Willow Street)
- Willow Street (Watts Street to Central Avenue)
- Broadway (City Hall Avenue to Williams Street) - Preliminary Design

These projects are being funded through the City's Capital Improvement Plan, as well as various grants and loan programs.

Nine Minimum Controls

In accordance with Part I.B of the most recent NPDES permit, Chelsea has reviewed and updated its Nine Minimum Control (NMC) program and has modified its NMC program to enhance its effectiveness. In collaboration with the MWRA, Chelsea's NMC program includes, but is not limited to:

1. **Proper operation and regular maintenance programs for the sewer system and the combined sewer overflows.**

Each CSO structure and tidegate is inspected at least twice each month, once during high tide and once during low tide. These bi-monthly inspections allow us to promptly identify and correct any problems that might increase CSO activation frequency or discharge volume and also problems that could allow tidal waters to surge back into the sewer system. Written reports are completed for each inspection, and indicate the date, time, structure number, and operating condition of the CSO and tidegate. Copies of the inspection reports are maintained on file at the Water & Sewer Department.

Chelsea uses near-real-time operational data to identify maintenance concerns, such as malfunctions of metering equipment and tidegates. In addition, the web-based CSO application has added the capability to transmit alarms, including CSO activation and common indicators of operational dysfunction, providing improved operation and maintenance control for the CSOs.

Approximately 30,000 linear feet of sewer/drain and 450 catch basins are cleaned each year. The spoils from these cleaning operations are transported to a disposal facility in Melrose, MA.

2. **Maximum use of the collection system for storage.**

Maximum storage during wet weather events is obtained by properly regulating flow through the MWRA's Chelsea Creek Headworks and by maintaining CSO regulator weirs at the highest elevations possible while still preventing sanitary sewer overflows and providing necessary system flood control in large storms. Proper sewer system maintenance also maximizes storage capacity, including the fact that known sediment problem areas within the sewer system are inspected and, if necessary, cleaned prior to major storm events.

3. **Review and modification of the pretreatment program to ensure CSO impacts are minimized.**



The MWRA maintains a comprehensive industrial pretreatment program that monitors all of the industrial users discharging to the Chelsea sewer system. This program is regularly reviewed and updated as part of the Deer Island Treatment Plant NPDES discharge permit. Outside discharges of septage, holding tank wastes, or other materials to the combined sewer system are prohibited by sewer use ordinances of both Chelsea and the MWRA.

4. **Maximization of flow to the POTW for treatment.**

Flow to the Deer Island Treatment Plant is maximized by proper regulation of flow through the MWRA's Chelsea Creek Headworks (MWRA is currently constructing a major upgrade of this facility), and through design and construction of the MWRA relief sewers and other sewer improvements. In addition, maximum use of storage capacity, as discussed above, maximizes flow to the treatment plant.

5. **Prohibition of dry weather overflows from CSOs.**

According to metering data, there were no dry weather discharges from any of the CSOs during the 2021 monitoring period. Providing adequate capacity and ensuring structural integrity in the sewer system prevents dry weather overflows. All CSO monitoring equipment, web-based hosting of CSO data, and CSO activation alarms, are monitored by The City of Chelsea through a contract with Flow Assessment Services. This agreement allows identification of the occurrence of a dry-weather overflow at any of its CSOs in near real time.

6. **Control of solid and floatable materials in CSOs.**

Solid materials are controlled by the design and progressive installation of catch basins with minimum four-foot sumps and floatables control hoods, and through the proper operation and maintenance of sewer and drainage systems components as discussed above. Higher priority is also assigned to catch basins at lower elevations, and cleaning is performed more frequently. Floatable materials are also controlled by the installation of underflow baffles in the CSO structures that maximize the amount of floatables captured for transport to the Deer Island Treatment Plant for proper treatment and disposal. Baffles were installed at CSO structures by MWRA during construction of the Chelsea Trunk Sewer and the Chelsea Branch Sewer projects in 2000-2001.

7. **Pollution prevention programs that focus on contaminant reduction activities.**

The main component of Chelsea's pollution prevention program is regular street sweeping. Each street in Chelsea is swept twice each month roughly between March 1 and December 31. Parking is prohibited during sweeping to maximize its benefit. Curbside waste collection is also coordinated with sweeping such that sweeping follows scheduled trash pickup by one day. The street sweeping program has been in effect for many years. Chelsea maintains municipal trash receptacles strategically located throughout the city to reduce litter, which are emptied four times each week. The city owns a "Madvac" and vacuums litter that accumulates on sidewalks and curb lines on a regular schedule. In addition, Chelsea initiated the "Keep Chelsea Beautiful Campaign" to reduce street litter. Information concerning the "Keep Chelsea Beautiful Campaign" has been disseminated to the public through various partnered organizations in the city. Chelsea is in compliance with its NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, which in brief, is a regulation designed to reduce pollutants in stormwater through the implementation of structural and non-structural Best Management Practices.

8. **Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.**

In accordance with Part I.C.5 of the most recent CSO NPDES permit, Chelsea has posted the required identification signs at each of the permitted CSOs and has duplicated these signs in Spanish due to the large percentage of Spanish-speaking people within the city. In accordance with Part I.C.6 of the permit, in Chelsea issued an annual press release and updated the CSO information posted on its website to provide general information regarding CSOs, including potential health impacts, locations of CSO discharges,



overall status of CSO abatement programs, and the most recent information about CSO activation frequencies and volumes. A copy of this Annual Report is also made available on the City's website. In accordance with Part I.C.7 of the CSO NPDES permit, Chelsea provided 24-hour notification via email to regulators and identified stakeholders for all CSO activations in 2021.

9. **Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.**

The MWRA has a comprehensive water quality monitoring program associated with the CSOs in its system, including Chelsea's CSOs. Chelsea is also in partnership with the EPA and the Mystic River Watershed Association, who regularly collect ambient water quality samples in the receiving waters surrounding Chelsea. Sampling data has indicated that elevated bacteria levels are present in the Chelsea and Island End rivers; however, to our knowledge, no direct correlation has been made to Chelsea CSO activations. Rather, efforts have been focused on suspected illicit connections to the drainage systems tributary to the stormwater outfalls discharging to these rivers.

SUMMARY AND CONCLUSIONS

Chelsea continues to promote best practices and implementation of these to further lower activation frequencies. During this year, Chelsea has maintained compliance with the requirements of its NPDES permit and implementation of the Nine Minimum Controls.

Raising the weir at CHE004 has had a significant impact on the frequency and volume of activations released from that particular outfall. Given that 19.91 more inches of rain fell on Chelsea during 2021 than in 2020 we are pleased that the volume has been reduced from 1,188,082 gallons to 924,798 gallons with one less activation.

The design phase of MWRA's "CHE008 Pipe Replacement Project" has been completed. RE-081 which is located near the intersection of Eastern Ave. and Willoughby St. in Chelsea is connected to MWRA's "Structure C" by a 30-inch diameter ductile iron concrete lined pipe. In early April work will begin to replace the 30 inch pipe with a 48 Inch diameter pipe.

Chelsea plans to continue with the design and construction of sewer separation projects to minimize CSO activation frequencies and discharge volumes. Chelsea continues to strive to reduce pollutants discharged to our receiving waters from both CSO and stormwater outfalls.



Appendix A



CSO 004

2021 Chelsea, MA CSO Activity

Event	Start	Stop	Duration (minutes)	MGD	Rain (in)		Peak Hourly (5 minutes)		Gallons
					Daily		Peak Hourly	Peak Interval	
1	6/22/2021 15:15	6/22/2021 15:50	35	0.106587	1.35		0.9	0.15	106,587
2	7/2/2021 0:20	7/2/2021 1:55	95	0.702123	2.32		1.28	0.19	702,123
3	8/19/2021 10:50	8/19/2021 11:55	60	0.050299	2.03		1.07	0.20	50,299
4	8/22/2021 8:00	8/22/2021 8:15	15	0.014682	0.72		0.52	0.14	14,682
5	9/2/2021 2:05	9/2/2021 3:00	55	0.051107	2.5		1.14	0.17	51,107

Total Duration
(minutes) 260

Total Gallons
924,798



Total Gallons
5,409,643



Appendix B

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
1/1/2021 (Fri)	0.02	0.02	0.01
1/2/2021 (Sat)	0.23	0.06	0.01
1/3/2021 (Sun)	0.03	0.02	0.01
1/4/2021 (Mon)	0.00		
1/5/2021 (Tue)	0.00		
1/6/2021 (Wed)	0.00		
1/7/2021 (Thu)	0.00		
1/8/2021 (Fri)	0.00		
1/9/2021 (Sat)	0.00		
1/10/2021 (Sun)	0.00		
1/11/2021 (Mon)	0.00		
1/12/2021 (Tue)	0.00		
1/13/2021 (Wed)	0.00		
1/14/2021 (Thu)	0.05	0.02	0.01
1/15/2021 (Fri)	0.00		
1/16/2021 (Sat)	0.38	0.09	0.03
1/17/2021 (Sun)	0.00		
1/18/2021 (Mon)	0.00		
1/19/2021 (Tue)	0.00		
1/20/2021 (Wed)	0.00		
1/21/2021 (Thu)	0.00		
1/22/2021 (Fri)	0.00		
1/23/2021 (Sat)	0.00		
1/24/2021 (Sun)	0.00		
1/25/2021 (Mon)	0.00		
1/26/2021 (Tue)	0.00		
1/27/2021 (Wed)	0.03	0.02	0.01
1/28/2021 (Thu)	0.00		
1/29/2021 (Fri)	0.00		
1/30/2021 (Sat)	0.00		
1/31/2021 (Sun)	0.00		
2/1/2021 (Mon)	0.08	0.04	0.01
2/2/2021 (Tue)	0.52	0.11	0.02
2/3/2021 (Wed)	0.06	0.03	0.01
2/4/2021 (Thu)	0.00		
2/5/2021 (Fri)	0.01	0.01	0.01
2/6/2021 (Sat)	0.00		
2/7/2021 (Sun)	0.00		
2/8/2021 (Mon)	0.07	0.03	0.02
2/9/2021 (Tue)	0.00		
2/10/2021 (Wed)	0.02	0.01	0.01
2/11/2021 (Thu)	0.00		
2/12/2021 (Fri)	0.00		
2/13/2021 (Sat)	0.00		
2/14/2021 (Sun)	0.00		
2/15/2021 (Mon)	0.01	0.01	0.01
2/16/2021 (Tue)	0.44	0.13	0.03

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
2/17/2021 (Wed)	0.00		
2/18/2021 (Thu)	0.00		
2/19/2021 (Fri)	0.00		
2/20/2021 (Sat)	0.02	0.02	0.01
2/21/2021 (Sun)	0.03	0.02	0.01
2/22/2021 (Mon)	0.04	0.02	0.01
2/23/2021 (Tue)	0.00		
2/24/2021 (Wed)	0.00		
2/25/2021 (Thu)	0.00		
2/26/2021 (Fri)	0.00		
2/27/2021 (Sat)	0.04	0.02	0.01
2/28/2021 (Sun)	0.00		
3/1/2021 (Mon)	0.11	0.05	0.01
3/2/2021 (Tue)	0.00		
3/3/2021 (Wed)	0.00		
3/4/2021 (Thu)	0.00		
3/5/2021 (Fri)	0.00		
3/6/2021 (Sat)	0.00		
3/7/2021 (Sun)	0.00		
3/8/2021 (Mon)	0.00		
3/9/2021 (Tue)	0.00		
3/10/2021 (Wed)	0.00		
3/11/2021 (Thu)	0.00		
3/12/2021 (Fri)	0.00		
3/13/2021 (Sat)	0.00		
3/14/2021 (Sun)	0.00		
3/15/2021 (Mon)	0.00		
3/16/2021 (Tue)	0.00		
3/17/2021 (Wed)	0.00		
3/18/2021 (Thu)	0.21	0.09	0.01
3/19/2021 (Fri)	0.00		
3/20/2021 (Sat)	0.00		
3/21/2021 (Sun)	0.00		
3/22/2021 (Mon)	0.00		
3/23/2021 (Tue)	0.00		
3/24/2021 (Wed)	0.00		
3/25/2021 (Thu)	0.09	0.03	0.01
3/26/2021 (Fri)	0.00		
3/27/2021 (Sat)	0.00		
3/28/2021 (Sun)	0.15	0.06	0.03
3/29/2021 (Mon)	0.00		
3/30/2021 (Tue)	0.00		
3/31/2021 (Wed)	0.07	0.04	0.01
4/1/2021 (Thu)	0.52	0.21	0.04
4/2/2021 (Fri)	0.00		
4/3/2021 (Sat)	0.00		
4/4/2021 (Sun)	0.00		

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
4/5/2021 (Mon)	0.00		
4/6/2021 (Tue)	0.00		
4/7/2021 (Wed)	0.00		
4/8/2021 (Thu)	0.00		
4/9/2021 (Fri)	0.00		
4/10/2021 (Sat)	0.00		
4/11/2021 (Sun)	0.00		
4/12/2021 (Mon)	0.00		
4/13/2021 (Tue)	0.00		
4/14/2021 (Wed)	0.00		
4/15/2021 (Thu)	0.11	0.04	0.01
4/16/2021 (Fri)	0.79	0.14	0.02
4/17/2021 (Sat)	0.00		
4/18/2021 (Sun)	0.00		
4/19/2021 (Mon)	0.00		
4/20/2021 (Tue)	0.00		
4/21/2021 (Wed)	0.22	0.10	0.03
4/22/2021 (Thu)	0.00		
4/23/2021 (Fri)	0.00		
4/24/2021 (Sat)	0.00		
4/25/2021 (Sun)	0.05	0.03	0.01
4/26/2021 (Mon)	0.00		
4/27/2021 (Tue)	0.00		
4/28/2021 (Wed)	0.18	0.14	0.03
4/29/2021 (Thu)	0.43	0.10	0.03
4/30/2021 (Fri)	0.01	0.01	0.01
5/1/2021 (Sat)	0.00		
5/2/2021 (Sun)	0.00		
5/3/2021 (Mon)	0.00		
5/4/2021 (Tue)	0.34	0.10	0.02
5/5/2021 (Wed)	0.11	0.06	0.02
5/6/2021 (Thu)	0.00		
5/7/2021 (Fri)	0.00		
5/8/2021 (Sat)	0.00		
5/9/2021 (Sun)	0.00		
5/10/2021 (Mon)	0.13	0.06	0.02
5/11/2021 (Tue)	0.00		
5/12/2021 (Wed)	0.02	0.02	0.02
5/13/2021 (Thu)	0.00		
5/14/2021 (Fri)	0.00		
5/15/2021 (Sat)	0.00		
5/16/2021 (Sun)	0.00		
5/17/2021 (Mon)	0.00		
5/18/2021 (Tue)	0.00		
5/19/2021 (Wed)	0.00		
5/20/2021 (Thu)	0.00		
5/21/2021 (Fri)	0.00		

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
5/22/2021 (Sat)	0.00		
5/23/2021 (Sun)	0.00		
5/24/2021 (Mon)	0.00		
5/25/2021 (Tue)	0.00		
5/26/2021 (Wed)	0.41	0.22	0.09
5/27/2021 (Thu)	0.01	0.01	0.01
5/28/2021 (Fri)	1.07	0.26	0.03
5/29/2021 (Sat)	1.17	0.22	0.03
5/30/2021 (Sun)	0.73	0.14	0.02
5/31/2021 (Mon)	0.13	0.04	0.02
6/1/2021 (Tue)	0.00		
6/2/2021 (Wed)	0.00		
6/3/2021 (Thu)	0.00		
6/4/2021 (Fri)	0.08	0.07	0.04
6/5/2021 (Sat)	0.00		
6/6/2021 (Sun)	0.00		
6/7/2021 (Mon)	0.00		
6/8/2021 (Tue)	0.00		
6/9/2021 (Wed)	0.02	0.01	0.01
6/10/2021 (Thu)	0.00		
6/11/2021 (Fri)	0.15	0.08	0.01
6/12/2021 (Sat)	0.58	0.19	0.03
6/13/2021 (Sun)	0.00		
6/14/2021 (Mon)	0.47	0.15	0.06
6/15/2021 (Tue)	0.02	0.02	0.01
6/16/2021 (Wed)	0.00		
6/17/2021 (Thu)	0.00		
6/18/2021 (Fri)	0.00		
6/19/2021 (Sat)	0.00		
6/20/2021 (Sun)	0.00		
6/21/2021 (Mon)	0.00		
6/22/2021 (Tue)	1.35	0.90	0.15
6/23/2021 (Wed)	0.00		
6/24/2021 (Thu)	0.00		
6/25/2021 (Fri)	0.06	0.02	0.01
6/26/2021 (Sat)	0.00		
6/27/2021 (Sun)	0.00		
6/28/2021 (Mon)	0.00		
6/29/2021 (Tue)	0.00		
6/30/2021 (Wed)	0.28	0.12	0.06
7/1/2021 (Thu)	1.08	0.34	0.08
7/2/2021 (Fri)	2.32	1.28	0.19
7/3/2021 (Sat)	1.34	0.28	0.03
7/4/2021 (Sun)	0.29	0.17	0.02
7/5/2021 (Mon)	0.01	0.01	0.01
7/6/2021 (Tue)	0.13	0.12	0.03
7/7/2021 (Wed)	0.06	0.06	0.01

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
7/8/2021 (Thu)	0.24	0.17	0.04
7/9/2021 (Fri)	2.25	0.79	0.11
7/10/2021 (Sat)	0.01	0.01	0.01
7/11/2021 (Sun)	0.04	0.04	0.02
7/12/2021 (Mon)	0.75	0.38	0.09
7/13/2021 (Tue)	0.01	0.01	0.01
7/14/2021 (Wed)	0.00		
7/15/2021 (Thu)	0.00		
7/16/2021 (Fri)	0.00		
7/17/2021 (Sat)	0.08	0.04	0.01
7/18/2021 (Sun)	0.22	0.16	0.05
7/19/2021 (Mon)	0.00		
7/20/2021 (Tue)	0.00		
7/21/2021 (Wed)	0.00		
7/22/2021 (Thu)	0.00		
7/23/2021 (Fri)	0.00		
7/24/2021 (Sat)	0.00		
7/25/2021 (Sun)	0.02	0.01	0.01
7/26/2021 (Mon)	0.00		
7/27/2021 (Tue)	0.72	0.65	0.15
7/28/2021 (Wed)	0.00		
7/29/2021 (Thu)	0.03	0.02	0.01
7/30/2021 (Fri)	0.26	0.26	0.11
7/31/2021 (Sat)	0.00		
8/1/2021 (Sun)	0.00		
8/2/2021 (Mon)	0.00		
8/3/2021 (Tue)	0.00		
8/4/2021 (Wed)	0.44	0.31	0.04
8/5/2021 (Thu)	1.00	0.25	0.06
8/6/2021 (Fri)	0.00		
8/7/2021 (Sat)	0.00		
8/8/2021 (Sun)	0.00		
8/9/2021 (Mon)	0.92	0.49	0.09
8/10/2021 (Tue)	0.09	0.04	0.01
8/11/2021 (Wed)	0.00		
8/12/2021 (Thu)	0.00		
8/13/2021 (Fri)	0.00		
8/14/2021 (Sat)	0.00		
8/15/2021 (Sun)	0.00		
8/16/2021 (Mon)	0.00		
8/17/2021 (Tue)	0.00		
8/18/2021 (Wed)	0.00		
8/19/2021 (Thu)	2.03	1.07	0.20
8/20/2021 (Fri)	0.04	0.03	0.01
8/21/2021 (Sat)	0.00		
8/22/2021 (Sun)	0.72	0.52	0.14
8/23/2021 (Mon)	1.07	0.50	0.12

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
8/24/2021 (Tue)	0.00		
8/25/2021 (Wed)	0.00		
8/26/2021 (Thu)	0.00		
8/27/2021 (Fri)	0.00		
8/28/2021 (Sat)	0.07	0.06	0.02
8/29/2021 (Sun)	0.00		
8/30/2021 (Mon)	0.16	0.16	0.13
8/31/2021 (Tue)	0.00		
9/1/2021 (Wed)	1.89	0.51	0.11
9/2/2021 (Thu)	2.50	1.14	0.17
9/3/2021 (Fri)	0.00		
9/4/2021 (Sat)	0.00		
9/5/2021 (Sun)	0.00		
9/6/2021 (Mon)	0.00		
9/7/2021 (Tue)	0.00		
9/8/2021 (Wed)	0.00		
9/9/2021 (Thu)	0.81	0.29	0.06
9/10/2021 (Fri)	0.08	0.07	0.02
9/11/2021 (Sat)	0.00		
9/12/2021 (Sun)	0.00		
9/13/2021 (Mon)	0.04	0.02	0.02
9/14/2021 (Tue)	0.00		
9/15/2021 (Wed)	0.00		
9/16/2021 (Thu)	0.38	0.34	0.09
9/17/2021 (Fri)	0.00		
9/18/2021 (Sat)	0.11	0.11	0.07
9/19/2021 (Sun)	0.56	0.38	0.18
9/20/2021 (Mon)	0.00		
9/21/2021 (Tue)	0.00		
9/22/2021 (Wed)	0.00		
9/23/2021 (Thu)	0.00		
9/24/2021 (Fri)	0.00		
9/25/2021 (Sat)	0.01	0.01	0.01
9/26/2021 (Sun)	0.38	0.25	0.03
9/27/2021 (Mon)	0.00		
9/28/2021 (Tue)	0.98	0.27	0.10
9/29/2021 (Wed)	0.00		
9/30/2021 (Thu)	0.00		
10/1/2021 (Fri)	0.00		
10/2/2021 (Sat)	0.00		
10/3/2021 (Sun)	0.14	0.11	0.02
10/4/2021 (Mon)	1.24	0.27	0.06
10/5/2021 (Tue)	0.39	0.27	0.06
10/6/2021 (Wed)	0.00		
10/7/2021 (Thu)	0.00		
10/8/2021 (Fri)	0.00		
10/9/2021 (Sat)	0.00		

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
10/10/2021 (Sun)	0.00		
10/11/2021 (Mon)	0.00		
10/12/2021 (Tue)	0.00		
10/13/2021 (Wed)	0.00		
10/14/2021 (Thu)	0.00		
10/15/2021 (Fri)	0.00		
10/16/2021 (Sat)	0.02	0.02	0.02
10/17/2021 (Sun)	0.22	0.10	0.02
10/18/2021 (Mon)	0.00		
10/19/2021 (Tue)	0.00		
10/20/2021 (Wed)	0.00		
10/21/2021 (Thu)	0.00		
10/22/2021 (Fri)	0.00		
10/23/2021 (Sat)	0.00		
10/24/2021 (Sun)	0.00		
10/25/2021 (Mon)	0.65	0.17	0.05
10/26/2021 (Tue)	1.47	0.24	0.10
10/27/2021 (Wed)	0.51	0.10	0.02
10/28/2021 (Thu)	0.00		
10/29/2021 (Fri)	0.00		
10/30/2021 (Sat)	1.12	0.62	0.19
10/31/2021 (Sun)	0.55	0.20	0.07
11/1/2021 (Mon)	0.00		
11/2/2021 (Tue)	0.00		
11/3/2021 (Wed)	0.00		
11/4/2021 (Thu)	0.00		
11/5/2021 (Fri)	0.00		
11/6/2021 (Sat)	0.00		
11/7/2021 (Sun)	0.00		
11/8/2021 (Mon)	0.00		
11/9/2021 (Tue)	0.00		
11/10/2021 (Wed)	0.00		
11/11/2021 (Thu)	0.00		
11/12/2021 (Fri)	0.64	0.26	0.05
11/13/2021 (Sat)	0.17	0.15	0.04
11/14/2021 (Sun)	0.00		
11/15/2021 (Mon)	0.02	0.01	0.01
11/16/2021 (Tue)	0.00		
11/17/2021 (Wed)	0.00		
11/18/2021 (Thu)	0.00		
11/19/2021 (Fri)	0.20	0.09	0.02
11/20/2021 (Sat)	0.00		
11/21/2021 (Sun)	0.00		
11/22/2021 (Mon)	0.37	0.16	0.09
11/23/2021 (Tue)	0.33	0.28	0.28
11/24/2021 (Wed)	0.00		
11/25/2021 (Thu)	0.00		

Summary Rainfall Report



Site:

Rain

380 Beacham St. - DPW

Chelsea, MA

Date	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
11/26/2021 (Fri)	0.02	0.01	0.01
11/27/2021 (Sat)	0.00		
11/28/2021 (Sun)	0.00		
11/29/2021 (Mon)	0.01	0.01	0.01
11/30/2021 (Tue)	0.00		
12/1/2021 (Wed)	0.08	0.08	0.08
12/2/2021 (Thu)	0.01	0.01	0.01
12/3/2021 (Fri)	0.00		
12/4/2021 (Sat)	0.00		
12/5/2021 (Sun)	0.00		
12/6/2021 (Mon)	0.21	0.13	0.08
12/7/2021 (Tue)	0.00		
12/8/2021 (Wed)	0.00		
12/9/2021 (Thu)	0.00		
12/10/2021 (Fri)	0.00		
12/11/2021 (Sat)	0.09	0.03	0.01
12/12/2021 (Sun)	0.03	0.03	0.01
12/13/2021 (Mon)	0.00		
12/14/2021 (Tue)	0.00		
12/15/2021 (Wed)	0.01	0.01	0.01
12/16/2021 (Thu)	0.17	0.06	0.06
12/17/2021 (Fri)	0.00		
12/18/2021 (Sat)	0.27	0.06	0.01
12/19/2021 (Sun)	0.31	0.10	0.02
12/20/2021 (Mon)	0.00		
12/21/2021 (Tue)	0.00		
12/22/2021 (Wed)	0.07	0.06	0.02
12/23/2021 (Thu)	0.00		
12/24/2021 (Fri)	0.00		
12/25/2021 (Sat)	0.26	0.08	0.01
12/26/2021 (Sun)	0.26	0.10	0.01
12/27/2021 (Mon)	0.00		
12/28/2021 (Tue)	0.02	0.01	0.01
12/29/2021 (Wed)	0.00		
12/30/2021 (Thu)	0.02	0.01	0.01
12/31/2021 (Fri)	0.01	0.01	0.01
Total for period	46.18		