

City of Anacortes
NPDES Permit No. WA0020257
2024
CSO & Wet Weather Operation Report

The City of Anacortes currently has two combined sewer overflow (CSO) locations as identified in the NPDES Permit issued to the City of Anacortes Wastewater Treatment Plant. Both outfalls satisfy the Washington State requirement of “greatest reasonable reduction” defined in WAC 173-245-020(22) by meeting the standard of not more than one discharge event per outfall per year on average and therefore are classified as controlled CSOs.

Background

Areas within the City of Anacortes are served by a partially combined sewer system where both the storm and sanitary sewer systems are joined. The City of Anacortes has two CSOs which have the potential to allow untreated wastewater combined with stormwater to discharge to Guemes Channel during extreme storm events. The CSOs are identified as CSO Outfall 002, the “B Avenue CSO” and CSO Outfall 004, the “Q Avenue CSO”.

Outfall 002 – B Avenue CSO

The B Avenue CSO is located one-half block north of the intersection of B Avenue and 11th Street. Discharges from the CSO occur when combined stormwater and sanitary sewer levels rise high enough in the collection system to overflow a dam in the CSO manhole separating the manhole channel from the CSO outfall pipe. Flow from the CSO is discharged into Guemes Channel through a 12-inch pipe to the outfall located at latitude: 48.515278, longitude: -122.634167 as stated in the NPDES permit.

The B Avenue CSO is monitored with an ISCO Teledyne Laserflow sensor connected to the WWTP SCADA system. The flow meter measures level and velocity to determine flow which is reported to the treatment plant via a telemetry system. When the meter is active a signal is transmitted to the plant which activates an alarm in the SCADA system indicating overflow at this CSO. Flow data and totalized flow are recorded by the plant data acquisition system and are available for publishing on plant reports.

Outfall 004 – Q Avenue CSO

The Q Avenue CSO manhole is located at the intersection of 2nd Street and Commercial Avenue on Port of Anacortes property leased to Dakota Creek Industries, Inc. (DCI) who operates a shipyard on this site. This CSO is in a Residential/Commercial/Industrial zoned drainage basin. The outfall pipe is located at the northernmost end of Q Avenue directly underneath DCI's syncro lift facility which they use to haul large ships out of the water for maintenance. Discharges from this CSO occur when combined stormwater and sanitary sewer levels rise high enough in the collection system to overflow a concrete dam separating the manhole channel from the CSO outfall pipe in the CSO manhole at 2nd Street and Commercial Avenue. The concrete dam is equipped with a scum baffle to keep solids and floatables out of the CSO flow stream. Flow from the CSO is discharged into Guemes Channel through the outfall located at latitude: 48.521667, longitude: -122.609444 as stated in the NPDES permit.

The Q Avenue CSO is monitored by a Krohne Tidal Flux Magmeter and flow logging system installed in October 2018. The flow meter measures level and velocity to determine flow which is reported to the treatment plant via a telemetry system. Flow data and totalized flow are recorded by the plant data acquisition system and are available for publishing on plant reports. This site has a local flow totalizer as a back up to the telemetry and SCADA system. Impending overflow events are detected via a float switch which provides an alarm at the treatment plant. The float switch is activated when the level in the sewer system approaches the height of the overflow weir. The alarm alerts plant personnel of the impending CSO activity.

Rainfall Data

Rainfall reported is recorded at the Anacortes Wastewater Treatment Plant by a tipping bucket rain gauge. Rainfall totals are reported from midnight to midnight daily. Rainfall totals at the WWTP have been recorded since 2005.

Supporting Documents and Public Notice

Detailed information for the B Avenue and Q Avenue CSOs are included in later next sections of this report with applicable flow trends included in Table 1 and Table 2.

Rainfall data is included in Appendix A.

CSO Event Summary

Table 1 and Table 2 include specific information for CSO events at each outfall in the last 5 years and a 20-year summary of the total number of CSO events per outfall.

B Avenue CSO

There have been no overflow events caused by precipitation at this CSO since 1997 and one discharge caused by equipment malfunction in 2018 during a power outage when the automatic transfer switch failed to transfer the pump station from line power to the emergency generator. This event was reported under ERTS 679072.

The average frequency of overflow events at this CSO in the past 20 years is equivalent to zero events, or a 0% probability of an overflow event occurring during any given year.

Table 1. City of Anacortes Wastewater Collection System B Avenue CSO History

B Avenue CSO – Discharge 002					
Permitted CSO due to precipitation					
Date	Duration (hours)	Overflow Total (gallons)	Precipitation During Event (inches)	Storm Duration	Comments
1997 - 2024	n/a	0			
SSO discharge through CSO Outfall – (unpermitted event not caused by precipitation)					
2/4/18	12 minutes	3,400	Estimated Flow Volume. Discharge reported under ERTS 679072.		
5 Year Average Number of CSO Events: 0 (No precipitation CSO events since 1997)					

Q Avenue CSO

Flow monitoring was installed on this CSO in January of 1998. A total of twelve overflow events caused by precipitation have occurred during the past twenty-five years: one in 2003, two in 2007, one in 2009, one in 2010, two in 2015, one in 2016, one in 2018, one in 2020, one in 2021, and one in 2022.

The average frequency of overflow events at this CSO in the past 25 years is equivalent to one event every 2.1 years, or a 48% probability of an overflow event occurring during any given year.

The NPDES permit requires that a five year moving average value for CSO events be calculated and reported. During the last five years there have been three events at this CSO. This equates to one event every 1.7 years, or a 60% probability that a CSO event would occur during any given year.

Table 2. City of Anacortes Wastewater Collection System Q Avenue CSO 5-year History

Q Avenue CSO – Discharge 004					
Date	Duration (hours)	Overflow Total (gallons)	Precipitation During Event (inches)	Storm Duration	Comments
12/21/2020	7.77	248,800	1.86	22 hrs	
11/15/2021	6.87	339,400	2.30	45 hrs	
1/6/2022	2.85	45,990	1.42	25 hrs	
2023	0	0			
2024	0	0			
5 Year Average Number of CSO Events: 0.6	Past 21 years (2002-2024): 12 CSO events				

2024 Annual Rainfall: 30.44 inches

Sewer Line Repairs and CSO Reduction Accomplishments

Anacortes' primary focus for sewer line improvements in 2024 has continued to be the ongoing construction directed toward the outfall replacement project.

Additional I&I and CSO reduction efforts included the following

1. PW-24-099-SEW-001 \$984,720 Basin B, D, E, &G sanitary sewer line CIPP rehabilitations.
2. PW-24-112-SEW-001 \$413,697: Work between 25th-28th and Commercial Ave and Q Ave.
 - 538 feet of 6" sewer mains were replaced with 8" sewer mains.
 - Three existing brick manholes were replaced with new Type 3 manholes.
 - Six cleanouts were replaced with Type 3 manholes.
 - Fifteen side sewers were reconnected.

The City began hydraulic modeling of the sanitary sewer collection system in 2024. Existing engineering records, along with GIS and Cartegraph databases were combined with historic sewer flows and rainfall records, and additional portable flow recording stations were deployed during the peak rain events of 2024. The completed model will be functional and will be published in mid 2025 alongside the General Sewer Plan. Continuing calibrations and updates will be a perpetual process, allowing the City to guide it's ongoing efforts in future I&I reduction projects.

Planned Improvements

Anacortes has begun construction of the new WWTP outfall and relocated CSO Outfall. The project includes relocating and increasing the capacity of the WWTP outfall along with re-routing flows from the Q Ave CSO Outfall to the new WWTP outfall. The marine portion of the new outfall in Guemes channel was completed in late summer 2024. Construction of the upland portion of the new outfall is scheduled for substantial completion in July 2025. Activation of the new outfall (and deactivation of the existing outfall) will be dependent upon the issuance of a new NPDES permit by the Washington Dept of Ecology.

The planned CSO pump station which is intended to eliminate precipitation induced SSOs along the South Trunk and minimize CSO total volumes through controlled pumping is at 100% design and will be out to bid in May 2025. Construction is expected to occur 2025-2026.

Wet Weather Report Summary of Secondary Bypass Events

Internal bypasses of the secondary process occur when influent flow to the Anacortes Wastewater Treatment Plant exceeds the capacity of the secondary treatment process (7.8 MGD). All secondary bypass volumes continue to be disinfected. Information about secondary bypass events is summarized in the table below:

Date	Duration (hours)	Bypass Volume in gallons	Flow at the time bypass started	Precipitation (inches)
1/6/2022	2.0	87,683	8.05	1.0
1/7/2022	15.5	1,159,030	8.05	0.42
11/4/2022	7.7	513,130	8.28	2.25
12/7/2023	2.2	48,140	8.24	0.93
2024	0	0	0	na

Appendix A
Anacortes Wastewater Plant
Annual Rainfall Report
2024

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.00	0.04	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.76	0.00
2	0.05	0.00	0.20	0.15	0.00	0.38	0.00	0.00	0.00	0.00	0.12	0.00
3	0.01	0.04	0.08	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00
4	0.08	0.00	0.15	0.00	0.00	0.02	0.00	0.00	0.00	0.35	0.27	0.00
5	0.05	0.03	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.25	0.06	0.00	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
8	0.57	0.07	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.14	0.01	0.33
9	0.39	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00
10	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00
11	0.03	0.35	0.04	0.02	0.00	0.01	0.00	0.00	0.03	0.00	0.39	0.00
12	0.00	0.18	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.21	0.13
14	0.00	0.01	0.00	0.00	0.00	0.54	0.00	0.00	0.12	0.02	0.29	0.02
15	0.00	0.04	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.01	0.00	0.01
16	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.20	0.12
17	0.58	0.00	0.00	0.00	0.00	0.03	0.00	0.12	0.00	0.20	0.15	0.74
18	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.37	0.52	0.46
19	0.38	0.09	0.00	0.00	0.01	0.00	0.00	0.00	0.00	1.23	0.14	0.09
20	0.00	0.02	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.27	0.13	0.01
21	0.24	0.08	0.01	0.02	0.88	0.00	0.00	0.00	0.00	0.80	0.10	0.05
22	0.37	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.07	0.08
23	0.08	0.00	0.37	0.00	0.00	0.00	0.00	0.35	0.04	0.01	0.00	0.10
24	0.14	0.22	0.00	0.00	0.11	0.00	0.00	1.41	0.00	0.01	0.00	0.22
25	0.01	0.49	0.09	0.43	0.08	0.00	0.00	0.00	0.68	0.00	0.25	0.10
26	0.20	0.12	0.00	0.09	0.17	0.10	0.00	0.50	0.06	0.09	0.02	0.22
27	0.38	0.02	0.29	0.22	0.00	0.03	0.00	0.10	0.00	0.42	0.11	0.03
28	0.25	0.31	0.00	0.19	0.49	0.06	0.00	0.00	0.00	0.06	0.00	0.01
29	0.00	0.35	0.00	0.09	0.12	0.05	0.53	0.00	0.00	0.00	0.00	0.30
30	0.00		0.00	0.23	0.00	0.00	0.04	0.00	0.00	0.01	0.00	0.01
31	0.00		0.00		0.00		0.00	0.00		0.08		0.00
Monthly Total	4.65	2.52	1.42	1.86	2.10	1.79	0.57	2.70	1.02	4.21	4.12	3.48

Annual Rainfall

30.44

(Rainfall totals are reported from midnight to midnight)

*Long-term climate data for Anacortes (NOAA station 450176), 1892 to 2016:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	45.1	48.6	52.4	57.8	63.6	68.2	72.2	72.2	67.5	59.2	51.0	46.3	58.7
Average Min. Temperature (F)	34.5	35.9	38.1	41.6	45.7	49.6	51.7	51.8	49.4	44.6	39.4	36.0	43.2
Average Total Precipitation (in.)	3.56	2.48	2.31	1.83	1.57	1.37	0.80	1.00	1.53	2.64	3.84	3.79	26.73
Average Total SnowFall (in.)	2.1	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	5.1