CITY OF ANACORTES
1998 CSO REPORT

GENERAL INFORMATION

Discharge number 002 was monitored with a Marsh-McBirney Model 256A flow meter.

The Model 256A flow meter measures level and velocity and reports flows to the treatment plant via a radio telemetry system. When the meter is active the plant control system is programmed to activate an alarm that indicates overflow at this CSO.

Discharge number 003 was monitored with Marsh-McBirney Model 260 portable flow meter system.

The Model 260 flow meter measures level and velocity. The level and velocity measurements are stored in the meter, in the field. The meters are periodically "uploaded" to a laptop computer, level; velocity and error logs are transferred to the computer. The Marsh-McBirney T50 version 1.7 Floware Software package computes flows from this information, and generates reports.

The level and velocity-sensing device was placed directly in the outfall pipes. The flow monitored was actual flow discharged.

The flow meters detect levels in excess of 0.4 inches. In pipe flows that do not reach or exceed 0.4 inches are not measured.

The flow meters detect velocity only when the level is in excess of one inch. Therefore the flow cannot be totaled unless the level in the pipe exceeds one inch.

The flow meters were set to record the level and velocity for 60 seconds, once every fifteen minutes.

Flow information is reported from 12:00 p. m. (midnight) to 11:59:59 p. m. (midnight) on the indicated day. Rainfall totals are reported from 7:00 a. m. on the indicated day to 6:59:59 a. m. on the following day. Rainfall reported is recorded at the Anacortes Wastewater Treatment Plant by a tipping bucket rain guage.

Daily flow totals for Discharge #002, the B Avenue CSO, are included in appendix A. Daily flow totals for Discharge #003, the M Avenue CSO are included in appendix B. The hours of activity at Discharge #004, the Q Avenue CSO are also included in appendix A. Rainfall data is included in appendix C. Appendix D includes a map of the City of Anacortes, including wastewater pump stations identified by number.

DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE CONDITION, DISCHARGE NO. 002, "B" AVE. CSO

FREQUENCY and VOLUME

The flow meter is routinely read on a monthly basis. As stated previously, discharge number 002 was monitored with a Marsh-McBirney Model 256A flow meter. . This meter displays the total flow. The meter is also sending a flow signal to the treatment plant via a radio telemetry system. Flow signals from the meter activate an alarm at the treatment plant. Prior to January 7, 1998 the meter was read after flow events to keep track of flow totals. On January 7, 1998 the meter signal to the treatment plant was programmed into the report generation system. Hard copy reports of this flow data are now generated on a daily and monthly basis. Due to calibration of the system, the reporting system records approximately a one-gallon per minute signal, twenty-four hours per day. This results in a daily flow total of approximately 1475 gallons per day. This total is indicated on reports in Appendix A.

There are 5 anomalies on the reports. The anomalies are explained as follows:

Date	**Flow Total**	**Explanation**
February 22	60.8 gallons	The communication card that serves the master telemetry unit (MTU) failed. The card was immediately replaced with a spare. The loss of data resulted in a low flow total.
March 25	2209.7 gallons	The MTU had to be reprogrammed from flash E-PPROM memory resulting in a portion of the previous day's total being added to this day's total.
April 6	1363.3	Unknown cause, suspect communication errors.
November 23 November 24	1281.2 1306.8	Power outage at the treatment plant, the MTU was not connected to emergency power. The MTU has subsequently been connected to emergency power.

There are no overflow events to report in 1998.

Total rainfall measured in 1998 was 24.76

Discharge from this CSO can be caused by failure of an adjacent wastewater pump station. No overflow events occurred in 1998 as a result of failure of the pump station.

COMPARISON TO BASELINE

Annual precipitation was less in 1998 than in 1995, 1996 or 1997. There were no overflow events. Overflow events and the annual baseline are charted and included at the end of this section.

DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE CONDITION, DISCHARGE NO. 003, "M" AVE. CSO

The flow meter is routinely read on a monthly basis. A meter was in service continuously for the entire monitoring period.

There were no overflow events in 1998.

Total rainfall measured in 1998 was 24.76

COMPARISON TO BASELINE

The 1995 CSO report detailed three overflow events that were from unknown causes. It was stated in that report that the City would aggressively pursue any events of unknown cause in the future. No event of unknown cause has since been recorded.

Annual precipitation was less in 1998 than in 1995, 1996 or 1997. There were no overflow events. Overflow events and the annual baseline are charted and included at the end of this section.

1998

DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE CONDITION, DISCHARGE NO. 004, "Q" AVE. CSO

Previous reports contain considerable detail explaining why this CSO has not been monitored to date. For information regarding the history of this CSO please refer to last years report.

The City reported in the 1997 CSO report that discharge #004 would be monitored for frequency and duration (but not volume) during 1998. The equipment to perform this monitoring was installed in January 1998. Any overflow event at the CSO would set off an alarm at the treatment plant. In August 1998 the plant reporting system was modified to record and report the number of hours per day that the CSO was active.

The CSO was not active during 1998. As reported previously, Anacortes rainfall total for 1998 was 24.76 inches. No overflows with this annual rainfall shall be the initial baseline data for this CSO.

CSO REDUCTION ACCOMPLISHMENTS

The treatment plant reporting system has been modified to provide hard copy reports of all discharges from all combined sewer overflows.

Additional Marsh-McBirney flow meters were purchased to monitor flows in several drainage basins in the sanitary sewer collection system. This monitoring is being conducted to identify the sources of significant contributions of inflow and infiltration. The data gathered will be used to identify areas of the sanitary sewer to repair, and also to document the amount of storm and ground water removed from the system.

PLANNED IMPROVEMENTS

The improvements planned for 1999 are as follows:

1. Repair the outfall pipe that serves discharge #004 and install a flow meter to measure the quantity of overflow from CSO #004.
2. A storm sewer directly connected to the sanitary sewer has been discovered. The storm sewer serves a three-square block area, Commercial Avenue to O Avenue (one block) and from 10th Street to 13th Street. This area is in the down town area of Anacortes and is mostly asphalt. This storm sewer connection will be removed from the sanitary sewer in 1999.
3. The City Anacortes budgeted $160,000 to perform repairs to sewer lines in a sanitary sewer drainage basin. The drainage basin shall be selected as a result of flow monitoring.
4. Sewer pump station #3 is adjacent to CSO discharge #2. A failure of pump station #3 will cause discharge from CSO #2. Pump station #3 shall be upgraded and put on emergency power. This will virtually eliminate any possibility of CSO discharge caused by a pump station failure. The CSO meter will also be connected to emergency power.