



# Sanitary Sewer Overflow Annual Report

## Division of Surface Water

<b>Date:</b> 03/30/2022		
<b>Facility Name:</b> City of Canton Water Reclamation Facility		
<b>Ohio NPDES Permit Number:</b> 3PE00000*QD		
<b>Period Covered by Report:</b> 01/01/2021 - 12/31/2021		
<b>Contact Person:</b> James DiMarzio		<b>Title:</b> CSD Superintendent
<b>Mailing Address:</b> 2901 Regent Avenue NE		
<b>City:</b> Canton	<b>State:</b> OH	<b>Zip Code:</b> 44705
<b>Country:</b> USA		
<b>Sanitary Sewer Overflows Spreadsheet(attachment) :</b> <i>Sanitary_Sewer_Overflows_Spreadsheet_Canton_2021.xlsm</i>		
<b>Water In Basement Occurrences Spreadsheet(attachment) :</b> <i>Water_In_Basement_Occurrences_Spreadsheet_Canton_2021.xlsm</i>		
<b>Narrative analysis of WIB patterns by location, frequency and cause:</b> <i>See attachment "Water_In_Basement_Narratives_with_Attachments_Canton_2021.pdf"</i>		
<b>ADDITIONAL INFORMATION</b>		
<i>Please add any additional comments or attachments below.</i>		
Additional Information attachment(s): <i>Water_In_Basement_Narratives_with_Attachments_Canton_2021.pdf</i>		
<b>Certification</b>		
<i>I certify under penalty of law that I have personally examined and am familiar with the information in this report and all attachments. Based on my inquiry of those persons immediately responsible for obtaining the information contained in the report, I believe that the information is true, accurate, and complete.</i>		
<b>Name:</b> Douglas Harris		<b>Title:</b> Assistant Superintendent - Collections
<b>Signature(Electronically submitted by):</b> Douglas Harris (User ID: maddiepaje )		<b>Submission Date:</b> 03/30/2022







Enter narrative analysis of WIB patterns by location, frequency and cause.

In the past, the City has performed Inflow and Infiltration (I/I) Studies and Sanitary Sewer Evaluation Studies (SSES), via engineering consultants, to evaluate the condition of the sanitary sewer system. In these studies, the system was divided into several sewersheds. For the purpose of this annual report, we have utilized these sewersheds to determine the number of Water in Basement (WIB) occurrences reported in each. Areas outside of the limits of the previous engineering studies have since been added in a consistent manner and sewershed boundaries have been refined as information becomes available.

In 2021, the City utilized an updated 'Standard Operating Procedure (SOP) – Root Cause Analysis' (see Attachment A). As stated in the SOP, the Root Cause Analysis (RCA) is a process applied to failure incidents (including all SSO's / Property Back-up's / WIB's) which seeks to identify the fundamental cause(s) that led to the failure of any asset within the City's sanitary sewer collection system. RCA provides a systematic means to evaluate what caused a failure and then select a strategy to reduce the chance of a re-occurrence of the same or similar events within the collection system.

The goals of the RCA process are to:

1. Collect relevant information on the cause of a failure promptly, efficiently, and economically
2. Initiate activities to correct the cause(s) of the problem
3. Analyze the available information and formulate strategies or actions that will help prevent a re-occurrence of the problem

In 2021, CSD initiated 26 RCAs for 27 occurrences within the sanitary sewer system. Two occurrences were related to the same mainline issue and therefore combined into a single RCA. Four RCA's were related to the SSO's reported in Tables I and II of this report. Of the remaining RCAs, one was determined to be a private sewer issue and 22 were classified as Water in Basements (WIBs) caused by an issue within the publicly owned sanitary sewer system.

Per the RCA SOP, a CCTV investigation was completed for each publicly caused WIB to assist with determining the cause. The CCTV information was then added to the associated RCA form along with other information pertinent to the location and WIB event. The completed RCA form was then reviewed internally to determine follow-up actions, if any, for each WIB occurrence. Following is a summary of recommended actions for WIB related RCAs completed in 2021.

- Repair – Cured in Place Patch (3 locations)
- Repair – Sewer Main via open trench construction (9 locations)
- Repair – Manhole (1 location)
- Periodic Maintenance – Addition to or modification of routine maintenance list (8 locations/2 root related)
- Add to future Capital Improvement List (4 locations)
- Monitor over 5-year cleaning and CCTV schedule/No Further Action Required (6 locations)

In 2021, three of Canton's Public WIB occurrences were determined to potentially have been exacerbated by wet weather. These occurrences were as follows:

Date	Location	Precipitation (Inches)	Sewershed
5/9/2021	2209 MAPLE AVE NE	2.02	07 NE
7/11/2021	326 15TH ST NW	2.09	07 NW
7/11/2021	2209 MAPLE AVE NE	2.09	07 NE

Saturated ground conditions due to wet weather prior to each event (5/9/21 - 1.64" the week prior; 7/11/21 - 1.1" over previous four days) were also present at the time of these WIB events. The increase in flow due to infiltration combined with sediment build up in the sewers, as identified during the initial responses and follow-up CCTV, likely caused the WIBs. These sewers have been cleaned and will be monitored for further wet weather influences.

Enter narrative analysis of WIB patterns by location, frequency and cause.

The top 5 rain events occurred as stated in the following table which also includes the number of WIB's identified on each day. Although rain is not typically a factor in WIB occurrences, it did play a role in at least 3 WIB's in 2021 as noted above.

Date	Precipitation (Inches)	Public WIBs	Sewershed(s)
7/11/2021	2.09	2	07 NE & 07 NW
5/9/2021	2.02	1	07 NE
6/3/2021	1.34	0	N/A
8/13/2021	1.31	0	N/A
7/17/2021	1.21	0	N/A

In past annual reports, Canton typically analyzed sewersheds that had five or more Public WIB occurrences in the reporting year. For this reporting year, one sewershed (04 NW) that met this criterion. Following is the outcome of the Root Cause Analysis that was completed for each of the WIB occurrences in this sewershed:

Address	RCA Findings Investigation	Follow-up Action / Plan Moving Forward
2236 8 <sup>th</sup> St. NW	Initial Review: Line could not previously be televised due to access issues.  CCTV: Mineral deposits in the line.  Follow-up CCTV: Poor connection of the main to the DS MH (SAN-15578-MH)	Install manhole at US end of pipe to allow for future maintenance/ CCTV access (Completed 4/14/2021)  Mill out mineral deposits (Completed 4/20/2021)  Mainline sewer repair (Completed 4/20/2021)
1914 LANG PL NW	CCTV: Data shows a 50' sag in this line (From 70' DS to 120' DS).  As-Built Records: Pipe slope is 0.2%.	Pipe to be considered for a future CIP.  Possible need to re-route sewer to gain slope.
329 HARRISON AVE NW & 335 HARRISON AVE NW*	Initial Cleaning: Identified potential grease/rag problem at downstream 10-inch siphon.  CCTV: US sanitary (SAN-09523) was televised on 7/12/2021.  Follow-up Review: One of two 10-inch siphon pipes may require additional cleaning.	Siphon cleaning to be completed by private contractor. CSD reviewing various options.  Periodic #137 has been created for the Upstream and Downstream structures of the siphon to be checked every 30 days, and be cleaned as needed.
329 HARRISON AVE NW	See above	See above

\* Same cause for both WIB's on the same day.

Enter narrative analysis of WIB patterns by location, frequency and cause.

On September 27, 2004, Canton City Council passed Ordinance No. 195/2004 which established the Backwater Response Initiative (BRI) Program. The purpose of the BRI Program is to assist homeowners with chronic backwater flooding by providing for the installation of a backwater prevention device under the terms and conditions set forth in the BRI Program Policies. Approved applicants meeting the requirements of the program are eligible for 100% of the funds necessary to pay for installation of the backwater device, subject to availability of funds. Eligibility requirements were broadened by ordinance 143/2014 on July, 28, 2014.

Since the BRI Program's inception, Canton has sent out 127 BRI Application Packets to residences that had chronic backwater flooding. The Department has received 51 responses to the BRI Application Packets. The status of the 51 applicants is as follows:

- 27 have not met the program requirements or did not submit the required documentation.
- 1 sold the house (new owners have not responded).
- 23 backwater valves have been installed.

In 2018, Canton entered into an Administrative Order on Consent (AOC) with the USEPA. This AOC requires development and implementation of Asset Management and CMOM programs. It also requires the City to clean and televise all sewers 15 inches in diameter and smaller every five years. All larger diameter sewers are required to be televised every five years and cleaned if determined necessary. Although the AOC has only been in effect for less than four years, these additional requirements have had a positive impact on the number of publicly caused WIBs.

## 2.7 Root Cause Analysis

**Application :** Administrative Support  Field Operations

**Status:** Draft  Final  **Original Date:** 1/14/19 **Revision Date:** 12/15/21

**Reviewers:** DiMarzio, Harris

**Author:** Burgess & Niple **Revision Number:** 4

### INTRODUCTION/PURPOSE:

Root Cause Analysis (RCA) is a process applied to failure (SSO and Property Back-up/WIB) incidents which seeks to identify the fundamental cause(s) that lead to the failure of any asset within the City's sanitary sewer collection system. RCA will provide a systematic means to evaluate what caused a failure and then select a strategy to reduce the chance of a re-occurrence of the same or similar events within the collection system.

The goals of the RCA process are:

1. To collect relevant information on the cause of a failure promptly, efficiently, and economically
2. To initiate activities to correct the cause(s) of the problem
3. To analyze the available information and formulate strategies or actions that will help prevent a re-occurrence of the problem

Structured investigations that aim to identify the true cause of a failure incident and the actions necessary to correct the cause of the failure include the following components:

1. Evaluate the nature of the problem and collect available data
2. Assemble a team to perform the RCA
  - A. For a typical maintenance-caused or operation and maintenance (O&M) failure (e.g. due to Fats, Oils or Grease (FOG), roots, debris, pump station mechanical problem, etc.) the RCA team will consist of the Canton Collection Systems Department (CSD) management staff.
  - B. For structural and capacity-caused failures (e.g. due to broken pipe, collapsed sewer, surcharging of a sewer, manhole or wet well, etc.), the RCA team may include members of the CSD and the Engineering Department, as needed.
3. Analyze the collected data to identify the root cause(s)
4. Identify an appropriate strategy to reduce the likelihood of the failure re-occurring
  - A. Evaluate if a one-time activity is needed (e.g., repair, rehabilitation, replacement)
  - B. Evaluate if a programmatic solution is needed (e.g., addition to periodic maintenance list)
5. Implement the Recommended Action(s)
6. Close out the RCA Form, documenting all actions completed.



**PROCEDURE:**

The RCA procedure should be completed as soon as possible following the failure incident. The goal is to complete the RCA and initiate the Recommended Action within 30 days of the incident.

7. The RCA Form (see EXHIBIT 1) will be initiated by the CMOM Coordinator, with most of the information being auto-populated based on the work recorded in Cartegraph.
8. The following items are populated in the RCA form:

**SECTION 1 – Request Details**

- A. *Request #* - This is created when the Administrative Clerk (Dispatcher) creates a Request from a complaint.
- B. *Issue* - This is recorded by the Dispatcher (Typically a Sanitary Sewer Backup, Sanitary Sewer Overflow, or Odor Complaint)
- C. *Address* - This is the location where the issue occurred.
- D. *Time Reported* - This represents the time that the call was received by the Dispatcher

**SECTION 2 – Cleaning Details**

- A. *Task #* - This is created when the responding CSD Crew creates a Cleaning Task in Cartegraph.
- B. *Work Performed* - This is populated based on the asset that is selected to be cleaned and also based on the activity selected in the Task Setup.
- C. *Length, Diameter, Year Installed* - These fields are all auto-populated based on the information stored in the GIS database for this specific asset.
- D. *Date Cleaned, Arrival Time, Departure Time* - These field are populated based on the information entered during the Cleaning Task as well as when the Task is completed.
- E. *Periodic* - This field is a “Yes” or “No” field, which identifies if the specific asset is on the Trouble List. This data is stored in the GIS Database.

**SECTION 3 – CCTV Details**

- A. *Task #* - This is automatically created when the “Public Issue” Checkbox is utilized on a Cleaning Task.
- B. *Work Performed* - This is generated based on the asset where the “Public Issue” occurred.
- C. *Televised By, Date Televised, and PACP Quick Rating* - These fields are all auto-populated based on the information stored in the GIS database for this specific asset and the information recorded on the CCTV Task.

**SECTION 4 – Additional Work Performed**

- A. *WO #* - This is the Work Order Number, which is automatically created when the “Public Issue” Checkbox is utilized on a Cleaning Task. The Cleaning Task is automatically linked to the Work Order, and the CCTV Task is created under this Work Order as well.
- B. *Task #* - This includes all tasks associated with the RCA Work Order Other than the Cleaning and Televising Tasks. If a repair or additional maintenance is required, it will be included in this section of the RCA Report.

**SECTION 5 – RCA Summary**

- A. This section is a brief narrative to explain the information presented in the report. It should provide a short explanation of the issue that initiated the RCA and how it was resolved.

**SECTION 6 – Approval** (Completed by CMOM Coordinator, CSD Superintendent and/or Canton City Engineer)

- A. When the report is complete, the CMOM Coordinator's will give the RCA Form to the CSD Superintendent for final review
- B. When the Superintendent's review is completed, the document will be signed and the CMOM Coordinator will electronically file the form (.pdf format) in the *CMOM/2.1.6.2 Root Cause Analysis* Folder.

## EXHIBIT 1 - RCA Form

## Root Cause Analysis (RCA) Form

RCA 21-017(SSO): 3417  
Westview Ave NW**Request Details**

Request #	Issue	Address	Time Reported
-----------	-------	---------	---------------

**Request Details**

Request #	Issue	Address	Time Reported
243	Sanitary Sewer Overflow - SSO	3417 WESTVIEW AVE NW	5/10/2021, 1:06:11 PM

**Cleaning Details**

Task #	Work Performed	Length	Diameter	Year Installed	Date Cleaned	Arrival Time	Departure Time	Periodic?
14335	Clean SAN-00983	335	8	1955	6/16/2021			
12278	Clean SAN-00983	340	8	1955	5/10/2021	1:30:00 PM	2:00:00 PM	

**CCTV Details**

Task #	Work Performed	Televised By	Date Televised	PACP Quick Rating
13228	CCTV SAN-00983	Chad Budd	6/3/2021	3.50
13394	CCTV SAN-00983	Chad Budd	6/16/2021	4.00

**Additional Work Performed**

WO #	Task #	Work Performed	Asset	Status	Date Completed
1217	13614	Hydro-Excavate		Completed	6/8/2021
1217	13396	Restore Pavement		Completed	6/10/2021
1217	13393	Repair	SAN-00983	Completed	6/8/2021
1217	13395	Utility Locates		Completed	6/10/2021
1217	13397	Barricade or Secure Perimeter		Completed	6/16/2021

**RCA Summary:**

Original CCTV (Task #13228) discovered a dropped femco from a previous repair. The repair was fixed (Task #13393) and the pipe has been retelevised.

Reviewed and Approved By

Date