Clean Water 2020 Program

CONSENT DECREE
ANNUAL REPORT

May 21, 2014 – December 31, 2014

We Are Columbia

As submitted to EPA for review and approval.

Initials

3.30.2015

Date

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Acronyms & Abbreviations

CAP – Capacity Assurance Program

CCTV – Closed Circuit Television

CD – Consent Decree

CE – City Engineer

CERP – Contingency Emergency Response Plan

CFO – Chief Financial Officer

CIP – Capital Improvements Program

City – City of Columbia

CMOM – Capacity, Management, Operations and Maintenance

CSAP – Continuing Sewer Assessment Program

CW2020 – City's Program to Manage the Consent Decree Compliance

CY – Calendar Year

DOJ – United States Department of Justice

DUE – Department of Utilities and Engineering

EACIP – Early Action Capital Improvement Projects

EPA – United States Environmental Protection Agency

FOG – Fats, Oils and Grease

FSE – Food Service Establishment

GIS – Geographic Information System

GSOMP – Gravity Sewer System Operation and Maintenance Program

IMS – Information Management System

IR – Infrastructure Rehabilitation [Program]

IRR – Infrastructure Rehabilitation Report

LGIM – Local Government Information Model

MAC – Maintenance and Compliance

NTP – Notice to Proceed

RFP – Request for Proposal

SCDHEC – South Carolina Department of Health and Environmental Control

SMP – Sewer Mapping Program

SORP – Sewer Overflow Response Program

SSES – Sanitary Sewer Evaluation Survey

SSO – Sanitary Sewer Overflow

TSOMP – Transmission System Operations and Maintenance Program

WCTS – Wastewater Collection and Transmission System

WWTP – Wastewater Treatment Plant

Section 1 Introduction

1.1 Summary of Reporting Requirements

On May 21, 2014 the City of Columbia (City) entered into a Consent Decree (CD) with the United States Environmental Protection Agency (EPA), the United States Department of Justice (DOJ) and the South Carolina Department of Health and Environmental Control (SCDHEC). To fulfill the reporting requirements as defined in Section IX.39.c of the CD, the City has prepared this *Annual Report*, which includes the following information (as excerpted from the CD):

1. A summary of the CMOM Programs implemented pursuant to this Consent Decree, including a comparison of actual performance with any performance measures that have been established;
2. A summary of each remedial measure and capital project implemented pursuant to this Consent Decree;
3. A trends analysis of the number, volume, duration, and cause of Columbia's SSOs for the previous twenty-four (24) month period.

1.2 Report Organization

This Annual Report is organized as follows:

Section 1 – Introduction

This section includes a summary of the reporting requirements and describes the report organization.

Section 2 – CMOM Programs Update

This section addresses the requirements of Section IX.39.c.(i) of the CD. The section provides a summary and update on the implementation of the specific Management, Operations, and Maintenance (MOM) Programs included in Section V.12 of the CD.

Section 3 – Capital Projects Update

This section addresses the requirements of Section IX.39.c.(ii) of the CD. The section provides a summary and update on the remedial measures and capital projects implemented as a part of the CD. The remedial measures and capital projects noted in this report are associated with the Early Action Capital Improvement Projects (EACIP) included in Section V.10 of the CD and the IR Report for the Wastewater Collection and Transmission System (WCTS) included in Section V.16 of the CD.

Section 4 – Sanitary Sewer Overflow (SSO) Trends Analysis

This section addresses the requirements of Section IX.39.c.(iii) of the CD. The section provides information on the number, volume, duration, and cause of the City's SSOs for the previous twenty-four month period.

Section 2 CMOM Programs Update

In accordance with Section IX.39.c.(i) of the CD, this section provides a summary and update on the implementation of the specific CMOM Programs included in Section V.12 of the Consent Decree. The Program elements addressed in this section provide information regarding activities involving the Metro Wastewater Treatment Plant (WWTP) as well as the City's WCTS.

2.1 Sewer Overflow Response Program (SORP)

The City has developed, maintains, and continues to implement a SORP. The plan was submitted to the EPA on September 9, 2013 and was incorporated into the CD as Appendix D.

Projects and significant activities completed during the current reporting period:

- Trained new hires and existing personnel on the use of the SORP (completed October 2014).
- Updated and redistributed the SORP to Department of Utilities and Engineering (DUE) personnel.

2.2 Contingency and Emergency Response Plan (CERP)

In consultation with SCDHEC, the City is to develop and submit to EPA and SCDHEC a CERP within 18 months of the Date of Entry of the CD.

2.3 WCTS Training Program

The City is to submit to EPA and SCDHEC a WCTS Training Program within 18 months of the Date of Entry of the CD.

2.4 Information Management System (IMS) Program

The City is to submit to EPA and SCDHEC an Information Management System (IMS) Program within 18 months of the Date of Entry of the CD.

2.5 Capacity Assurance Program (CAP)

The City is to submit to EPA and SCDHEC a CAP within 180 days after approval of the Hydraulic Model Report. Additionally, within 90 days after the Date of Entry of the CD, Columbia was required to establish a list of all authorized new sewer service connections or increases in flow from existing service connections, which flows have not yet been introduced into the WCTS. Columbia is required to update and maintain this list as necessary until full implementation of the CAP, as approved by EPA. In addition, upon execution of the CD and until EPA approves the CAP as required by Section 12.e, Columbia agreed to continue to implement its current capacity program.

Projects and significant activities completed during the current reporting period:

- Began collecting required information on approved new sewer service connections and

increases in flow from existing service connections, which have not yet been introduced into the WCTS.

- Provided satellite systems an initial notification on the requirements of tracking and submitting CAP information in their contributing areas that flow into the City's system.

2.6 Sewer Mapping Program

In accordance with the requirements of the CD, the City was to develop and submit a Sewer Mapping Program (SMP) to EPA and SCDHEC within 60 days of the date of entry of the CD.

Projects and significant activities completed during the current reporting period:

- Submitted the SMP to the EPA and SCDHEC on July 17, 2014; SMP was approved by the EPA on December 9, 2014.
- Developed, approved, and began to implement a new wastewater asset naming convention for pipes and manholes which will be compatible with all software packages as recommended in the SMP.
- Conducted a gap analysis to identify deficiencies in and required modifications to the existing geodatabase schema.
- Developed, approved, and began to implement a plan to migrate sewer system GIS data to the Esri Local Government Information Model (LGIM) which will support future off-the-shelf computer applications that are designed around the LGIM.
- Determined hardware, software, and storage needs for the SMP.
- Developed map products to support the following Program areas:
    - SSO mapping
    - Mapping support for City Wastewater
    - Capital Improvements Program (CIP) Project mapping
    - Sanitary Sewer Evaluation Survey (SSES) mapping
- Reviewed TSOMP force main data and began updating force main GIS data with information provided as part of the TSOMP delivery (see Section 2.8).

2.7 Fats, Oils, and Grease (FOG) Management Program

The City continues to implement its FOG Management Program. The FOG Management Program was submitted to the EPA on July 2, 2013 and incorporated into the CD as Appendix G.

Projects and significant activities completed during the current reporting period:

- Public education program and website information are available to the public to promote FOG awareness throughout the City of Columbia.
- New FOG software is being evaluated by City staff to replace existing software.

2.8 Transmission System Operations and Maintenance Program

The City is to submit to EPA and SCDHEC a Transmission System Operations and Maintenance Program (TSOMP) within one year after the Date of Entry of the CD.

2.9 Gravity Sewer System Operation and Maintenance Program

The City is to submit to EPA and SCDHEC a Gravity Sewer System Operation and Maintenance Program (GSOMP) within 18 months of the Date of Entry of the CD.

2.10 Financial Analysis Program

The City is to submit to EPA and SCDHEC a Financial Analysis Program within 18 months after the Date of Entry of the CD.

Section 3 Capital Projects Update

In accordance with Section IX.39.c.(ii) of the CD, the following section provides a summary and update on the remedial measures and capital projects implemented as a part of the Consent Decree.

3.1 Early Action Capital Improvement Projects (EACIP)

In accordance with Section V.10 of the CD, the City addressed needed improvements by implementing and completing the following EACIP for the Columbia Metro WWTP and the WCTS. An update for each project follows.

Table 1: EACIP Summary (V.10)

CIP #	Project Name	Project Status/Summary
SS6722	Metro WWTP Headworks Project	Completed prior to start of current reporting period.
SS7182	Aeration Improvements	Completed prior to start of current reporting period.
SS7058	Metro WWTP Disinfection Improvements	Completed prior to start of current reporting period.
SS6871	Secondary Clarifier Improvements at the WWTP	Completed prior to start of current reporting period.
SS7155	Metro WWTP Train 2 Pump Station Improvements	Completed prior to start of current reporting period.
SS7197	Metro WWTP DAF Improvements	Completed prior to start of current reporting period.
SS7101	Broad River Pump Station Improvements	Completed prior to start of current reporting period.
SS7702	North Columbia Pump Station Improvements	Completed prior to start of current reporting period.
SS7115-01	West Columbia Pump Station Improvements	Completed prior to start of current reporting period.
SS7115-02	Installation of 20,000 Linear Feet of 42-inch Force Main from West Columbia Pump Station to Metro WWTP	Completed prior to start of current reporting period.
SS7116	Saluda River Pump Station Improvements	Completed prior to start of current reporting period.

3.2 Infrastructure Rehabilitation Report (IRR) Projects

In accordance with Section V.16 of the CD, the City is to submit an IRR to EPA and SCDHEC summarizing the results of the Continuing Sewer Assessment Program (CSAP) of the major components of the WCTS and a description of proposed rehabilitation projects, including rehabilitation projects currently underway.

The following projects have already been identified, are currently in progress, and will also be included as part of the IRR upon submission to EPA and SCDHEC.

Table 2: IRR Projects (V.16)

CIP #	Project Name	Project Status/Summary
SS6833	Upgrade Piney Grove Lift Station	Design 100% complete in December 2014.
SS6966	Annual Rehab on Lines Less than 15"	Construction services included CCTV as well as pipe replacement/lining. Construction ongoing throughout 2014.
SS7076	30in Gravity Sewer Burnside to Bluff & I-77	Construction started prior to start of current reporting period and was completed in December 2014.
SS7199	Saluda River Basin SSES for SR-06 & 13	Construction NTP issued on July 31, 2014. Construction ongoing throughout remainder of 2014.
SS7207	Saluda River Basin SSES for SR-07 & 08	Construction NTP issued on August 15, 2014. Construction ongoing throughout remainder of 2014.
SS7208	Saluda River Basin SSES for SR-06 & 13	Construction NTP issued on August 19, 2014. Construction ongoing throughout remainder of 2014.
SS7218	West Columbia Basin SSES WC-02	Construction NTP issued on June 17, 2014. Construction ongoing throughout remainder of 2014.
SS7251	Blossom to Huger	Phases I and II construction began in July 2014. Construction ongoing throughout remainder of 2014.
SS7259	Replacement of 24" Smith Branch Outfall Underneath I-277	Design 100% complete in December 2014.

Section 4 Sanitary Sewer Overflow (SSO) Trends Analysis

In accordance with Section IX.39.c.(iii) of the CD, the following section provides a trends analysis of the number, volume, duration, and cause of the City's Sanitary Sewer Overflows (SSOs) for the previous twenty-four month period.

Items required include the detailed number (frequency) and volume, by cause, of reportable spills as well as a trend analysis of the number, volume, and cause of the City's SSOs, by month, for the previous twenty-four month period. Duration data is being captured for the current year and will be reported in subsequent annual reports.

4.1 SSO Frequency and Volume by Cause

The detailed number and volume, by cause, for reportable spills is presented for review. The following table represents the SSO volume spilled by cause, frequency and volume for calendar years 2013 and 2014.

Table 3: Total SSO Frequency and Volume by Cause, CY 2013 & 2014

SSO Cause	Frequency	Volume
Collapsed Line	19	38,332
Grease	65	56,737
3rd Party	16	35,583
Pump Station Failure	10	619,983
Roots	79	115,173
Debris	33	56,689
Wet Weather	36	1,665,879
Force Main	3	11,715
Wastewater Treatment Plant	9	11,776

The following table shows the SSO category (cause), number of SSOs of that category by month, and the total for each month in CY 2013 and CY 2014. The total number of SSOs by category is then calculated as a percentage of all SSOs for the overall time period.

Table 4: Monthly SSO Frequency by Cause, CY 2013 & 2014

Month / Year	Collapsed Line	Grease	3rd Party	Pump Station Failure	Roots	Debris	Wet Weather	Force Main	Wastewater Treatment Plant	Total
Jan-13	3	2	0	2	5	0	0	0	0	**12**
Feb-13	0	2	0	0	6	3	4	0	0	**15**
Mar-13	2	5	0	2	9	1	3	0	0	**22**
Apr-13	0	1	1	0	5	1	0	0	0	**8**
May-13	0	2	1	0	6	0	0	0	0	**9**
Jun-13	0	0	0	0	4	1	0	0	0	**5**
Jul-13	1	1	1	1	3	2	6	0	0	**15**
Aug-13	1	2	2	1	1	4	5	0	0	**16**
Sep-13	0	2	0	0	7	2	0	0	0	**11**
Oct-13	3	4	0	1	2	2	0	0	0	**12**
Nov-13	0	2	0	1	4	1	0	1	0	**9**
Dec-13	0	1	0	0	1	0	2	0	0	**4**
CY 2013 Total	**10**	**24**	**5**	**8**	**53**	**17**	**20**	**1**	**0**	**138**
Jan-14	0	2	1	0	1	6	6	0	2	**18**
Feb-14	1	3	2	0	5	2	0	0	0	**13**
Mar-14	0	5	2	0	4	0	4	0	0	**15**
Apr-14	0	7	0	0	5	2	0	0	1	**15**
May-14	0	2	3	1	3	0	0	1	0	**10**
Jun-14	2	4	1	0	1	0	0	0	2	**10**
Jul-14	1	2	1	0	1	0	0	0	1	**6**
Aug-14	1	4	0	0	2	0	0	0	1	**8**
Sep-14	2	3	0	0	1	2	1	0	1	**10**
Oct-14	0	2	0	1	0	0	0	1	1	**5**
Nov-14	1	4	0	0	0	1	0	0	0	**6**
Dec-14	1	3	1	0	3	3	5	0	0	**16**
CY 2014 Total	**9**	**41**	**11**	**2**	**26**	**16**	**16**	**2**	**9**	**132**
Grand Total	**19**	**65**	**16**	**10**	**79**	**33**	**36**	**3**	**9**	**270**
% of Total	**7.0%**	**24.1%**	**5.9%**	**3.7%**	**29.3%**	**12.2%**	**13.3%**	**1.1%**	**3.3%**	

In CY 2013, the highest number (39%) of reportable spills was attributable to roots. The next highest area of reportable spills was attributable to grease (17%). Wet weather represented 14% and debris 12%. In CY 2014, the highest number (31%) of reportable spills were grease related. The next highest area of reportable spills was attributable to roots (19%). Wet weather represented 12% and debris 12%.

Overall, grease, roots, and wet weather combined to represent a significant majority (67%) of the reportable spills for the period.

Figure 1: CY 2013 SSOs by Cause

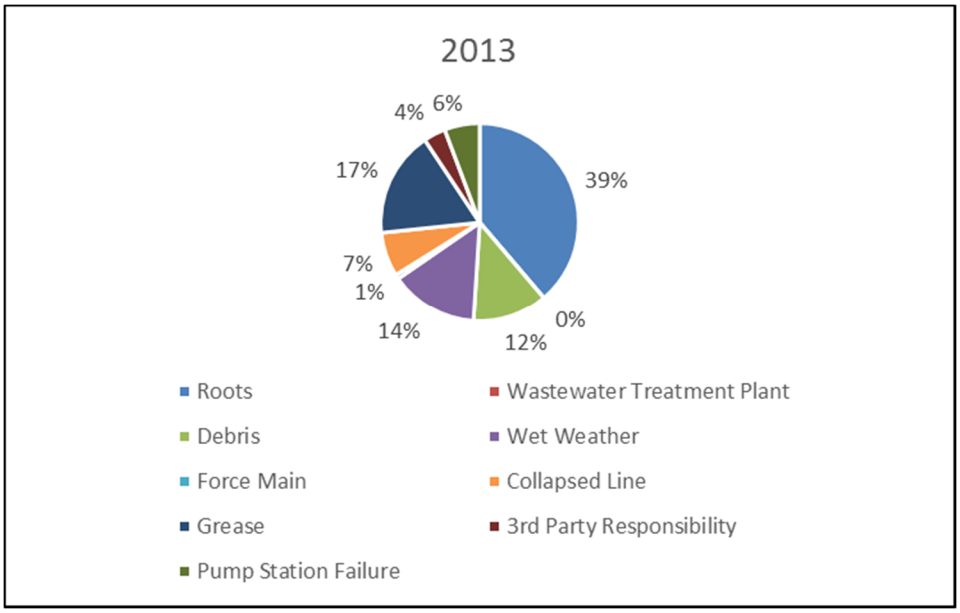
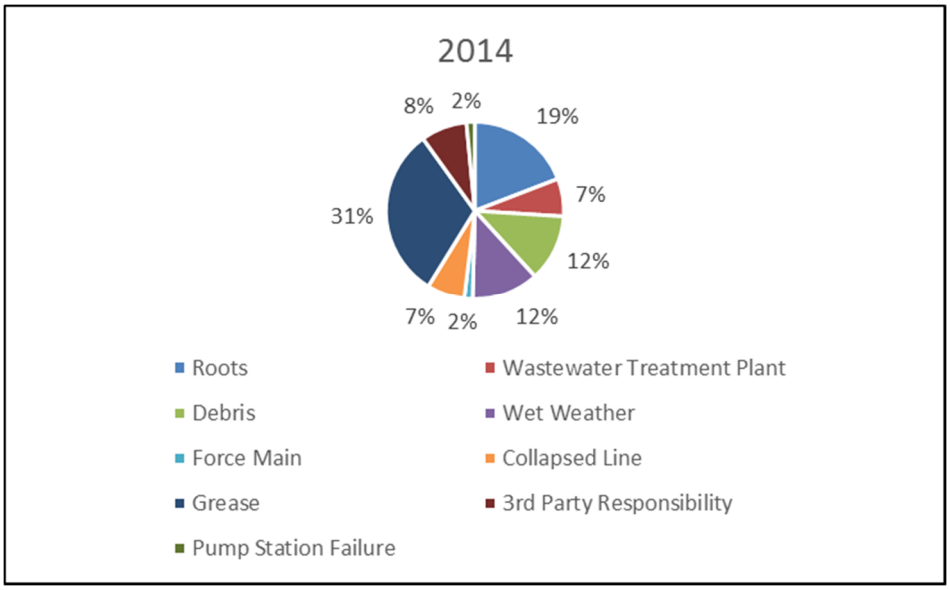


Figure 2: CY 2014 SSOs by Cause

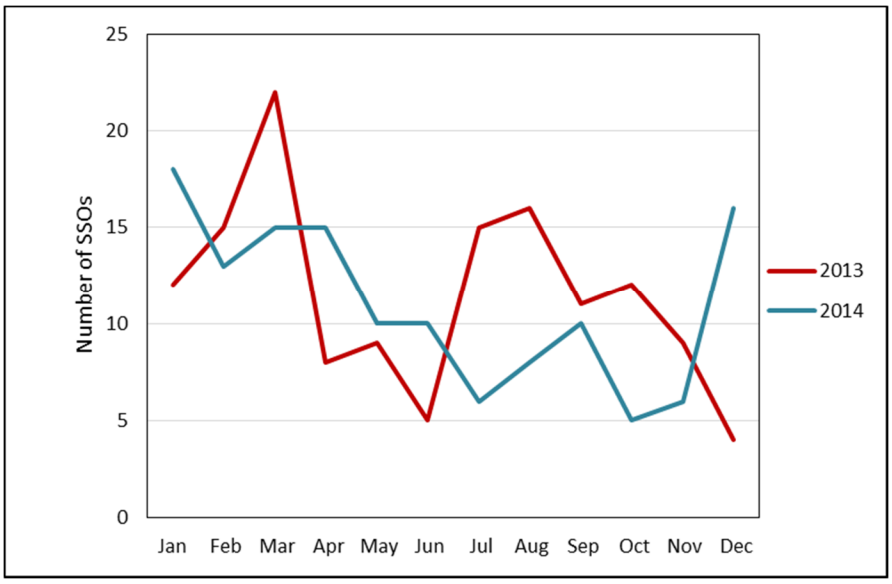


4.2 SSO Frequency and Volume by Month

As shown in the tables above, the City experienced a total of 138 SSOs in CY 2013. In CY 2014, the City experienced a total of 132 SSOs for a combined total of 270 SSOs and a net decrease of six SSOs from CY 2013. The average number of SSOs per month during CY 2013 was 11.5, and 11.0 in CY 2014. The

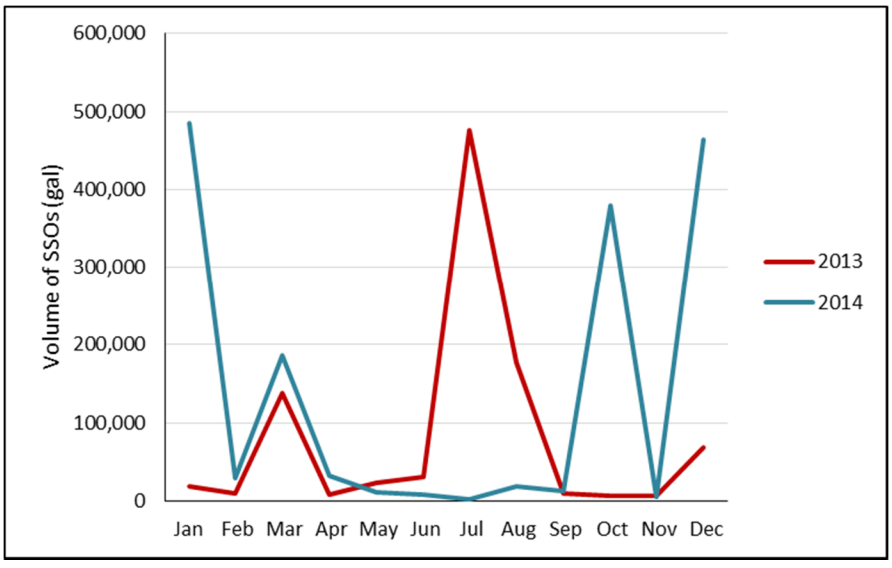
fluctuation in SSOs on a monthly basis is caused by a combination of wet weather, roots and grease. During CY 2013, February, March, July and August averaged 17 SSOs per month, well above the annual average. In CY 2014, January, March, April and December averaged 16 SSOs per month, once again well above the annual average of 11.0.

Figure 3: SSO Frequency by Month



During CY 2013, total volume spilled represented approximately 1.04 million gallons; in CY 2014, total volume spilled represented approximately 1.58 million gallons, for an estimated combined total volume of 2.6 million gallons. Wet weather events accounted for 57.2% of the volume spilled in CY 2013 and 68.1% of the volume spilled in CY 2014.

Figure 4: SSO Volume by Month



Based on an analysis of the wet weather SSO events, there is an identifiable correlation between spill volume and rainfall. During major rainfall events, the City experienced significant volume of SSOs related to wet weather.

4.3 SSOs per 100 Miles of Pipe

The City currently operates and maintains 1,100 miles of pipe. In CY 2013 the number of SSOs per 100 miles equaled 12.55 and in CY 2014 12.00. This is a decrease of 0.55 SSOs per 100 miles of pipe.

Figure 5: SSOs per 100 Miles of Pipe