CAPACITY ASSURANCE, MANAGEMENT, OPERATIONS, AND MAINTENANCE (CMOM) PROGRAM SUMMARY UPDATE

CONTINUING IMPROVEMENT IMPLEMENTATION PLAN

CITY OF HAMPTON
DEPARTMENT OF PUBLIC WORKS
WASTEWATER OPERATIONS DIVISION
HAMPTON, VIRGINIA

Updated November 2015
Acknowledgement

The City of Hampton, Department of Public Works, Wastewater Operations Division acknowledges the assistance of Woolpert, Inc.
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APPENDIX – REFERENCE DOCUMENTS (CD)

Listed below are all documents referenced in the Appendix:

00 CMOM Appendix Hyperlinks
  • Federal Water Pollution Control Act (includes Clean Water Act and Water Quality Act)
  • Virginia Water Quality Laws
  • Code of Virginia– Title 62.1: Waters of the State, Ports, and Harbors
  • City of Hampton Public Works website
  • City of Hampton Public Works Standards and Policies website
  • City of Hampton Community Development website
  • City of Hampton Municipal Code: Sewers and Sewage Disposal (Chapter 30)
  • City of Hampton FOG Ordinance (Code Chapter 30, Article V)
  • HRPDC Design and Construction Standards – Division 8

00 Consent Order cover ltr 2014 Locality Consent Order
00 Consent Order December 19, 2014
00 MOA January 14 Final
00 MOA Execution By City Manager
01 Hampton Strategic Plan for Wastewater Operations Division – Citizens Guide
01 Hampton Strategic Plan for Wastewater Operations Division – Final Report
01 SpConOrder_HamptonCity_AnnRep2010 (Annual Report)
01 SpConOrder_HamptonCity_AnnRep2011 (Annual Report)
01 SpConOrder_HamptonCity_AnnRep2012 (Annual Report)
01 SpConOrder_HamptonCity_AnnRep2013 (Annual Report)
01 SpConOrder_HamptonCity_AnnRep2014 (Annual Report)
02 A Procurement Flowchart
1.0 PURPOSE

BACKGROUND

During the summer and fall of 2008, the City of Hampton (COH) Department of Public Works, Wastewater Operations Division (the Division) undertook a self-audit of its wastewater collection system Capacity Assurance, Management, Operations, and Maintenance (CMOM) Program in response to a special order by consent (SOC) issued by the Virginia Department of Environmental Quality (VDEQ). Concurrently, the Division developed a strategic plan for making identified CMOM program improvements. The COH obtained approval for its CMOM program from VDEQ in February 2011. Several of the CMOM program improvements were based on complying with SOC in regards to completing a condition assessment and a hydraulic capacity assessment of its collection system for the development of a long-term Rehabilitation Plan and Regional Wet Weather Management Plan with Hampton Roads Sanitation District (HRSD).

PURPOSE OF UPDATING THIS DOCUMENT

In 2014, HRSD, the City of Hampton (COH) and 13 other Localities agreed on a “hybrid regionalization approach” for the development of a Regional Wet Weather Management Plan (RWWMP) with HRSD through the execution of a Memorandum of Agreement (MOA) with HRSD in February, 2014 (See Appendix for entire MOA). In summary, the “hybrid regionalization approach” makes HRSD responsible for development of the RWWMP and implementing it through its Federal Consent Decree. In addition, the MOA is based on VDEQ revising/replacing the 2007 SOC to accommodate this new approach. VDEQ decided to replace the SOC as generally described below (See Appendix for the entire SOC):

“Agreement and Order”

“By virtue of the authority granted it in Va. Code §§ 62.1-44.15, the Board orders each Locality, and each Locality agrees, from the effective date of this consent order forward, to implement a MOM program designed to maintain and operate Locality-owned collection system assets in accordance with industry accepted practices relating to sewer inspection, evaluation and repair of Significant Defects (not scheduled to be addressed by the RWWMP and excluding those for which HRSD is responsible pursuant to the Consent Decree as amended). The MOM program must document the MOM program elements used to manage each Locality’s sewer system and minimize unpermitted sanitary sewer overflows. The MOM program shall include a sanitary sewer overflow response plan and quantifiable parameters for assessing program implementation. Throughout the life of the MOM program, a meaningful set of enforceable quantitative performance measures must be maintained. Performance assessment measures may be added, deleted, and/or modified if such revision results in a better assessment of the performance and effectiveness of the MOM program.

Further the Board and the Localities understand and agree that this Order supersedes and terminates the Orders by Consent issued by the Board on September 26, 2007,
This document is an update of the 2010 CMOM document in order to meet the requirements of the new SOC. It has been developed through interviews and inspections completed in late 2013 and 2014. This document supersedes all prior documents.

The following items were established as the specific objectives of this CMOM document:

1. Produce a CMOM Program Summary update consistent with the 2010 version and that is still based upon the EPA 2001 CMOM document.

2. Determine the challenges facing the Division’s current CMOM program in meeting VDEQ’s requirements and expectations as well as the Division’s own strategic goals for regulatory compliance, customer service, asset management, and resource management.

3. Develop a CMOM program strategy that is in alignment with the Division’s strategic goals for regulatory compliance, customer service, asset management, and resource management and that is acceptable to VDEQ.

4. Identify and establish priorities for the individual CMOM program components that will be improved in order to more fully achieve the Division’s strategic goals.

5. Develop an implementation plan that: maintains the current CMOM program components that are sufficient; defines needed improvements on a priority basis utilizing a phased approach; establishes roles and responsibilities for implementing the plan; and, finally, establishes meaningful performance measures for gauging success.

This updated summary report contains general findings and observations made during the Division’s self-audit of its current CMOM program. This report also presents an updated framework for a CMOM program implementation plan that addresses improvement opportunities to assist the Division in receiving VDEQ regulatory acceptance.
2.0 APPRAOCH

The general approach followed while performing this update to the CMOM program audit and developing the CMOM program implementation plan included the following steps:

2.1 Update the Current CMOM Program Goals

The Division’s goals for the CMOM program audit were discussed with key Division management and senior staff.

2.2 Document the Current CMOM Program

The Division’s CMOM program activities were initially identified through document reviews, staff interviews, and on-site field observations that were performed during the time period from July through December 2008 and September 2010. CMOM program strengths, challenges, opportunities and threats were enumerated. Interviews in 2013 and 2014 discussed the implementation of these activities. Updates based on new or revised procedures are made in this document.

2.3 Determine Current CMOM Program Sufficiency

The Division’s CMOM program activities were evaluated in relation to the individual CMOM program components listed in the EPA CMOM rule.

2.4 Update Opportunities for Program Improvement

Meetings, and follow-up interviews, were conducted with key Division staff to discuss the CMOM program audit results, observed opportunities for improvement, and identified priority actions.

2.5 Update CMOM Program Strategic Implementation Plan

A CMOM program implementation plan was developed in 2008 and was generally followed to update this document.
Figure 1  CMOM Update Process
3.0 GENERAL FINDINGS

Summary

The City of Hampton’s Wastewater Operating Division has a number of strengths and is willing to blend new technology with a common sense approach that relies on keeping things as simple as is practical. The Division recognizes that there are a number of business practice areas that can, and should, be improved.

As part of the general findings, the following strengths, challenges, opportunities and threats were identified:

Strengths

- Knowledgeable and experienced management team
- Good internal communication
- Good mapping system (GIS)
- Good computerized information management system (Lucity)
- Good Supervisory Control and Data Acquisition (SCADA) system for monitoring and trending pumping stations’ performance
- Good knowledge of the condition of its collection system through the SSES program
- Good knowledge of the collection system capacity through the completion of its system-wide hydraulic model
- Implementation of a number of maintenance programs
- Most of the compliance assurance, management, operation, and maintenance programs being implemented have been documented.
- The Division has developed meaningful, Hampton specific “Performance Measures” that the Division can use to determine its progress and measure its success.
- The division met all deadlines and requirements of the September 26, 2007 VDEQ consent order.

Challenges

- Hampton’s Wastewater Division is one of a number of sewer utilities that comprise the Hampton Roads Sanitation District (HRSD) publicly owned treatment works (POTW) and, as a result, has to work in a close and collaborative manner with those utilities and HRSD itself.
- The sewer system is aged with areas that are 70 years old; approximately 72 percent of the system is approaching or has exceeded 50 years in age.
- Approximately 75% of the sewer pipe lines are constructed of vitrified clay pipe.
- A large part of the sewer system is below the groundwater table.
- The sewer system includes 67 miles of gravity sewer lines that are six inches in diameter or smaller.
- Changes to the VDEQ consent order based on the 2014 Memorandum of Agreement and the modifications to HRSD’s Consent Decree with EPA have led to uncertainty over capacity improvement and rehabilitation responsibilities.
Opportunities

- Utilize the revised VDEQ consent order to improve overall system performance and drive improved regional cooperation.

Threats

- Rising energy costs
- Volatility of fuel costs
- The unknown cost of Hybrid Regionalization approach on Hampton rate payers may impact the capability to adequately fund necessary activities
- Obtaining and maintaining adequate staffing levels
- Changes to city infrastructure requirements to account for coastal flooding events
- Other natural disasters or large-scale power outages
4.0 MOM SUMMARY

4.1 Introduction

The Wastewater Operations Division (the Division) of the Hampton Department of Public Works (DPW) operates, maintains, repairs and extends the sanitary sewer system for the City of Hampton, Virginia. The system collects sewage from commercial and residential properties in Hampton and pumps the sewage into HRSD regional system for additional transmission and for treatment at regional treatment facilities owned and operated by HRSD.

The Division currently has 90 positions and employs 69 full time staff members who are responsible for overseeing more than 435 miles of sewer mains, 40 miles of force mains, more than 10,000 manholes, and 108 pump stations. The system serves a relatively stable population of more than 146,000 persons, including both commercial and residential customers, in a 136 square mile area. The City’s drinking water is provided by Newport News Waterworks. The wastewater collection system is comprised of a large variety of pipe sizes and pipe materials as described in Table 1.

Table 1 Pipeline Assets and Attributes

<table>
<thead>
<tr>
<th>Gravity Sewer Size</th>
<th>Feet</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 4&quot;</td>
<td>6,071</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 6&quot;</td>
<td>349,554</td>
<td>66</td>
</tr>
<tr>
<td>8&quot; – 18&quot;</td>
<td>1,917,371</td>
<td>363</td>
</tr>
<tr>
<td>19&quot; - 36&quot;</td>
<td>10</td>
<td>0</td>
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<tr>
<td>&gt; 36&quot;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Type</td>
<td>Feet</td>
<td>Miles</td>
</tr>
<tr>
<td>Clay</td>
<td>1,673,630</td>
<td>317</td>
</tr>
<tr>
<td>PVC</td>
<td>125,756</td>
<td>24</td>
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<tr>
<td>Reinforced Concrete</td>
<td>3,459</td>
<td>1</td>
</tr>
<tr>
<td>Ductile Iron</td>
<td>86,196</td>
<td>16</td>
</tr>
<tr>
<td>Cast Iron</td>
<td>69,009</td>
<td>13</td>
</tr>
<tr>
<td>ABS/Truss</td>
<td>308,885</td>
<td>59</td>
</tr>
<tr>
<td>Force Main Size</td>
<td>Feet</td>
<td>Miles</td>
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<tr>
<td>≤ 6&quot;</td>
<td>48,614</td>
<td>9</td>
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<td>8&quot; – 18&quot;</td>
<td>157,131</td>
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<td>&gt; 18&quot;</td>
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<td>0</td>
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<td>Cast Iron</td>
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<td>22.4</td>
</tr>
<tr>
<td>ABS/Truss</td>
<td>107</td>
<td>0</td>
</tr>
</tbody>
</table>
4.2 CMOM Components

01 Goals to Meet General Standards

Regulatory Expectations:

- Properly manage, operate and maintain, at all times, all parts of the collection system that you own or over which you have operational control;
- Provide adequate capacity to convey base flows and peak flows for all parts of the collection system you own or over which you have operational control;
- Take all feasible steps to stop, and mitigate the impact of, sanitary sewer overflows in portions of the collection system you own or over which you have operational control;
- Provide notification to parties with a reasonable potential for exposure to pollutants associated with the overflow event; and
- Develop a written summary of your CMOM program and make it, and the audit under paragraph (e)(2)(ix) of this section, available to any member of the public upon request.

Separately, from the VDEQ Guidance Document

- Proper management operation, and maintenance of the collection system over which you have operations control,
- Stop/reduce and mitigate the impact of SSO in the portion of the collection system over which you have operational control,
- Providing notification to parties with a reasonable potential for exposure to pollutants associated with SSO events.

Lead Organizational Unit: Management Section with Management Team

Summary Description:

The City of Hampton is committed to achieving the goals established by the new 2014 VDEQ Consent Order, Virginia water quality law, and the Clean Water Act. The City is also committed to implementing wastewater collection system best practices as reflected by Environmental Protection Agency documents related to collection system CMOM.

The specific goals associated with Hampton’s CMOM Program include:

- To manage, operate, and maintain Hampton’s sanitary sewer system and work with HRSD to provide sufficient capacity in all areas of the collection and transmission systems and to minimize and prevent SSOs;
- To continue to identify, evaluate and rehabilitate areas in the sewerage system in order to improve capacity, system reliability, and to minimize and prevent SSOs;
- Achieve 100% compliance rate for meeting SSO notifications;
- To protect public health and the environment while providing reliable customer service; and
To document CMOM program compliance to VDEQ annually.

The City has formally adopted a resolution stating the above commitments through its compliance with the September 26, 2007 VDEQ consent order and has met all deadlines required of the December 19, 2014 consent order.

Challenge:
- Ensuring continued financial stability in a variable economy
- Accurately estimating capital improvement budgets to meet the needs arising from an aging infrastructure

Opportunity:
- None identified at this time.

Performance Measure(s):
- Number of preventable operations and maintenance-related SSOs reaching State waters
- Number of preventable peak flow capacity related SSOs reaching State waters
- Customer satisfaction ratings based on 311 call responses
- Publicly available CMOM Annual report on City of Hampton Public Works website

Additional Supporting Documents (In Appendix):
- Division's Updated Wastewater Strategic Plan 2013-2019
- Annual Reports for FY 2010 through FY 2014
- Federal Pollution Control Act and amendments (Clean Water Act) (hyperlink)
- Relevant sections of Virginia Water Quality law (hyperlink)
- Public Works website (hyperlink)
02 A Organization – Administrative and Maintenance Positions

Regulatory Expectations:

The wastewater utility must identify the administrative and maintenance positions responsible for implementing measures in the CMOM program, including lines of authority by organization chart or similar document.

Lead Organizational Unit: Management Section with Management Team

Summary Description:

The responsibility for managing, operating and maintaining the wastewater collection and transmission systems is vested in the Department of Public Works’ Wastewater Operations Division.

The Division is comprised of 90 positions staffed by 69 persons organized into four sections: Management; Pumping Station; Inflow and Infiltration (I&I); and Construction. There is a management team comprised of the Operations Manager, Section supervisors, and several senior staff. An organization chart of the Division is shown on Figure 2, with the whole Public Works Department in Figure 3.

The four sections include:

1. Management Section

The primary functions of the Management Section are:
- Division management
- Long range planning
- Financial management
- Enterprise information management
- Engineering support

2. Pumping Station Section

The primary functions of the Pumping Station Section are to:
- Monitor the pumping stations
- Maintain the pumping stations, force mains, and wet wells
- Monitor and maintain flow and rainfall monitors

3. Inflow and Infiltration (I&I) Section

The primary functions of the I&I Section are to:
- Maintain the gravity sewer system
- Rehabilitate system manholes and gravity lines
• Conduct condition assessments of the gravity system assets

4. Construction Section

The primary functions of the Construction Section are to:
• Construct new sewer service extensions
• Repair pipelines and manholes
• Replace existing main and lateral pipelines

Currently, there are 21 vacant positions: eight in Construction, nine in I&I, three in Pump Stations and one in Administration.

The Division uses several different types of incentives to maintain employee satisfaction. Training classes are made available to employees on several different subjects, including: specialty equipment (ie. Vaccon, pump stations), GIS, and safety. Additionally, participation in the California State University, Sacramento, Operation and Maintenance of Wastewater Collection Systems Field Study Training Program is encouraged for those in the I&I group. Recognition lunches are held regularly to mark special achievements. There is also a Division wide program which recognizes good work with awards of compensatory time.

Challenges:
• Aging workforce
• Large number of vacancies
• Ensuring adequate staff training as the duties related to managing, operating and maintaining wastewater collection systems become more technical and complex
• Assure that staff compensation is competitive with nearby sewerage utilities and the private sector

Opportunities:
• Develop and implement an employee retention plan

Performance Measure(s):
• Current staff level versus authorized positions
• Number of staff vacancies

Supporting Documents (In Appendix):
• Wastewater Division Organizational Chart
• Procurement Process Flowchart
• Public Works Organization Chart
Figure 2  Overview Waste Water Operations Division Organization Chart
Figure 3  Overview City of Hampton Public Works Organization Chart
02 B  Organization – Chain of Communication for Reporting SSOs

Regulatory Expectations:

The utility must identify the chain of communication for reporting SSOs from receipt of complaint or other information to the person responsible for reporting to the National Pollutant Discharge Elimination System (NPDES) authority, or where necessary, the public.

Lead Organizational Unit: Management Section with Management Team

Summary Description:

The Division considers SSOs to have the highest priority and has a standard operating procedure (SOP) for responding to them. SOP describes the chain of communication for reporting SSOs. A chart describing the SSO SOP is shown Figure 4, right. The sanitary sewer overflow response SOP and its details presented in Sections 07 A-E of this summary.

SSOs are coded as required by the Roads Regional Sanitary Sewer SSORS Cause List. The Lucity information management system a numerical cause list that aligns with regional standard. The list of codes for SSOs is shown in Table 2 located on the following page. These causes are by cleaning and CCTV which are performed after resolution of every SSO.

All SSOs are reported in accordance DEQ approved reporting system SSORS used by HRSD and all the associated localities.

Table 2 Codes for SSO Causes

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause</th>
<th>Explanation</th>
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<tbody>
<tr>
<td></td>
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<td>highest</td>
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Figure 4  Overview of Sanitary Sewer Overflow Response SOP
1. Capacity, weather related
   Overflow caused by a lack of available capacity in the pipe, pump station or downstream infrastructure caused by rainfall and/or high tides and flooding. It is critical to note the circumstances surrounding this type of event – i.e., rainfall amount, surface flooding, etc.

2. Infrastructure
   Overflow caused by equipment and/or pipe failure. This would include pump/motor failure in pump stations, pipe collapses, etc. Overflows caused by maintenance related circumstances (see below) should not be reported in this group. Identifying these causes sometimes requires internal inspection.

3. Maintenance, grease
   Overflow caused by maintenance related issue including grease, roots and/or debris build up. Identifying these causes sometimes requires internal inspection.

4. Maintenance, roots

5. Maintenance, debris

6. Maintenance, other

7. Power outage
   Overflow caused by a loss of grid power not related to storm conditions including third party actions and failure of grid power in non-storm conditions.

8. Power outage, storm
   Overflow caused by a loss of grid power or lightning strikes to facilities directly attributable to a storm.

9. Damage by others
   Overflow caused by third parties including boring/excavation contractor hits and vandalism. Information should be referenced regarding the nature of the damage and measured taken prior (i.e., utility locate activities, locks, fences, etc.) to prevent damage.

10. Other
    Overflows caused by circumstances not fitting one of the above. This cause should be used rarely.

The I&I section has set its goals for emergency response time higher than Department Policy as shown in Table 3 below.

<table>
<thead>
<tr>
<th>Type of Response</th>
<th>Department Policy</th>
<th>I&amp;I Section Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overflows</td>
<td>Less than one hour</td>
<td>Immediate</td>
</tr>
<tr>
<td>Stoppages and Blockages</td>
<td>Four hours or less</td>
<td>Two Hours or less</td>
</tr>
</tbody>
</table>

Lucity cannot currently track response times. The upgraded version that has recently been installed has the capability to track emergency response time but this function has not yet been implemented. The field crews have been provided with laptops in the stoppage vehicles. Work orders are being delivered to the trucks live through Lucity’s wireless portal.

Stoppage response procedures ensure that the causes of SSOs are properly identified. CCTV is performed after every stoppage to verify cause and identify work orders to prevent future occurrence.
Challenges:
• Assuring twenty-four hour staff availability to ensure proper response to SSOs
• Assuring that proper SSO notification is made
• Assuring that SSO causes are correctly identified and reported by staff

Opportunity:
• None identified at this time.

Performance Measure(s):
• Compliance rate for meeting SSO notification and reporting requirements

Supporting Documents (In Appendix):
• Sanitary Sewer Overflow Response Plan
03 A-E Legal Authority

Regulatory Expectation

The utility must have legal authority, through sewer use ordinances, service agreements, regulations or other legally binding documents, to:

• Control infiltration and connections from inflow sources,
• Require that sewers and connections be properly designed and constructed,
• Ensure proper installation, testing, and inspection of new and rehabilitated sewers (such as new or rehabilitated collector sewers and new or rehabilitated service laterals,
• Address flows from municipal satellite collection systems, and
• Implement the general and specific prohibitions of the national pretreatment program that the utility is subject to under 40 CFR 403.5.

Lead Organizational Unit: Management Section

Summary Description:

Currently, the Division’s full legal authority resides within the City of Hampton’s Sewer Use Ordinance. The sewer use ordinance can be found on the internet at http://www.municode.com/resources/gateway.asp?pid=14532&sid=46, Chapter 30.

The legal authority that requires sewers and connections to be properly designed and constructed can be found in Section 30-4 of the Sewer Use Ordinance. Section 30-4 establishes that “all sewers constructed by, or under contract with, the City as provided in Section 30-3 shall be of such size and established with such grade and constructed in accord with such other specifications as may be prescribed by the director of the Department of Public Works in accordance with uniform City standards.”

The legal authority to control infiltration and connections from inflow sources can be found in Section 30-9: Drainage of rainwater into sanitary sewer. Section 30-9 states that “it shall be unlawful for any person to connect any roof, downspout, yard or walkway drain or any other drain carrying rainwater into any house service sewer or other sewer connected with any public sewer designed and constructed as a sanitary sewer only, or into any sewer leading into any public sewer designed and constructed as a sanitary sewer only.”

The legal authority to ensure proper installation, testing and inspection of new and rehabilitated sewers (collector lines or service laterals) can be found in Section 30-3: Sewers in streets or other areas open or dedicated to public use to be installed by city or its contractors and Section 30-4: Sewer Specifications. Section 30-3 states that “all sewers, except those installed in subdivisions by the developer in accordance with Section 35-79 of this Code, that may be constructed by any person in any street, lot, alley or parking space now open to public use or in any street, lot, parking space or easement duly dedicated for public use in the city shall be installed by, or under contract with, the city.” And Section 30-4 establishes that “all sewers constructed by, or under contract with, the City as provided in Section 30-3 shall be of such size and established with such
grade and constructed in accord with such other specifications as may be prescribed by the
director of the Department of Public Works in accordance with uniform City standards.”

Sewer Use Ordinance Table of Contents

Article I. In General
  Sec. 30-1. Violations of chapter.
  Sec. 30-2. Jurisdiction and control of sewers by city.
  Sec. 30-3. Sewers in streets or other areas open or dedicated to public use to be installed
            by city or its contractors.
  Sec. 30-4. Sewer specifications.
  Sec. 30-5. Deposit, etc., required for construction of sewer system.
  Sec. 30-6. Disposition of funds collected under this article, Article II, Article III and
            section 35-79.
  Sec. 30-7. Obstructing, damaging, etc., sewers generally.
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Article II. Connections to Public Sewers
  Sec. 30-21. When required.
  Sec. 30-22. Permit generally.
  Sec. 30-23. Fees—Generally.
  Sec. 30-24. Same—Installment payment.
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            sewer.
  Sec. 30-26. Extension of system for connection.
  Sec. 30-27. Supervision.
  Sec. 30-28. Additional connection to same property.
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Article III. Sewer Use Charges
  Sec. 30-46. Definitions.
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  Sec. 30-49. Determination of billing.
  Sec. 30-50. Discontinuance of water service for failure to pay.
  Sec. 30-51. Previous balance to be paid prior to new service or transfer of service.
  Secs. 30-52 to 30-65. Reserved.

Article IV. Individual Sewage Disposal Systems
  Sec. 30-66. Compliance with state regulations.
  Sec. 30-67. Registration, license and bond of installers, repairers or cleaners.
  Sec. 30-68. Misuse or neglect.
  Sec. 30-69. Maintenance and repair of on-site sewage treatment systems.
  Sec. 30-70. Abandonment of septic tanks, cesspools, etc.
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Article V. Fats, Oils and Grease (FOG)
  Sec. 30-76. - Purpose and applicability.
  Sec. 30-77. - Definitions.
  Sec. 30-78. - Grease control devices.
  Sec. 30-79. - Registration requirements.
  Sec. 30-80. - Discharge limits.
  Sec. 30-81. - Grease haulers.
  Sec. 30-82. - Violations and penalties.
  Sec. 30-83. - Severability

In January 2010, the City passed a FOG Ordinance. This ordinance is identical to those instituted by other Hampton Roads communities. A FOG coordinator position has been filled.

**Challenge:**
- The City’s ordinances do not specifically address the issue of controlling fats, oils and greases (FOG) from multi-family residential and other residential properties.
- The City’s ordinances do not specifically address issues related to the condition of the private service laterals.

**Opportunity:**
- Expand the City of Hampton’s legal authority to address issues related to FOG and inflow/infiltration from all private property.

**Performance Measure(s):**
- *To be developed after legal authority is obtained.*

**Supporting Documents (In Appendix):**
- Hampton Sewers and Sewage Disposal: Municipal Code, Chapter 30 (hyperlink)
- Hampton FOG Ordinance: Code Chapter 30, Article V - Fats, Oils and Grease (hyperlink)
- FOG Coordinator Job Description
04 Measures and Activities

Regulatory Expectation

The CMOM program must address the following elements that are appropriate and applicable to the system and identify the person or position in the organization responsible for each element.

The EPA approach intentionally did not provide a great deal of detail for this functional area which was merely termed “Measures and Activities.” The reason behind that approach is to allow each utility to develop and implement the appropriate measures and activities specific to its own needs. For this report, the Measures and Activities component has been divided into thirteen appropriate and applicable categories.

04 A Maintenance Facilities and Equipment

Regulatory Expectation

The wastewater utility must provide adequate maintenance facilities and equipment.

Lead Organizational Unit: Management Section

Summary Description:

The Division maintains facilities to support the operation and maintenance of the sanitary sewer system. These maintenance facilities are located at 550 North Back River Road in Hampton. The Division shares these facilities with the other Public Works Divisions.

The Division has three CCTV trucks: two box trucks and one small van. Other major equipment is listed in Table 4 below.

Vactor
Table 4 Major Equipment

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Equipment</th>
<th>Quantity</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Backhoes</td>
<td>2</td>
<td>Utility Truck</td>
</tr>
<tr>
<td>6</td>
<td>Cargo Van</td>
<td>4</td>
<td>Vaccon Trucks</td>
</tr>
<tr>
<td>7</td>
<td>Dump Trucks</td>
<td>1</td>
<td>Vactor Truck</td>
</tr>
<tr>
<td>3</td>
<td>Excavators</td>
<td>1</td>
<td>Welder</td>
</tr>
<tr>
<td>2</td>
<td>Flatbed</td>
<td>1</td>
<td>Arrow Board</td>
</tr>
<tr>
<td>13</td>
<td>Pickup Trucks</td>
<td>1</td>
<td>Saw, Asphalt/Concrete, Walk Behind</td>
</tr>
<tr>
<td>3</td>
<td>Interstate Trailers</td>
<td>1</td>
<td>Saw, Manhole, Core Drill</td>
</tr>
<tr>
<td>1</td>
<td>Sweeper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Trailers</td>
<td>2</td>
<td>Compressors</td>
</tr>
<tr>
<td>5</td>
<td>Trench Boxes</td>
<td>8</td>
<td>Generators</td>
</tr>
<tr>
<td>4</td>
<td>Truck, 4WD SUV</td>
<td>2</td>
<td>Generator, portable</td>
</tr>
<tr>
<td>5</td>
<td>Utility Body Truck</td>
<td>2</td>
<td>Light Towers, 4000 Watt Portable</td>
</tr>
<tr>
<td>3</td>
<td>TV Trucks</td>
<td>1</td>
<td>Portable Pump</td>
</tr>
<tr>
<td>1</td>
<td>Lateral TV Truck</td>
<td>1</td>
<td>Stoppage response truck</td>
</tr>
</tbody>
</table>

Fleet management is provided by the Fleet Services Division of the Public Works Department. There are two dedicated mechanics that provide services to the Division’s vehicles. Their work includes the chassis as well as the specialty mounted equipment. If these mechanics can’t make the required repair, they will contract the repair out to a local repair shop. Equipment is serviced within an adequate time frame. Fleet service work is tracked in the Fleet Focus System; this system keeps the maintenance schedule for all vehicles. A list is sent to the Division each month enumerating the vehicles that will require PM in the following month.

A memorandum of agreement was executed between the Division and Fleet Services when they took over fleet maintenance. Fleet has specific performance goals developed for vehicle down time and turnaround time as documented in the memorandum of agreement. Fleet services has a goal of 98 percent PM compliance and 95 percent PM completion (that is 98 percent of vehicles will be turned in for PM within the month scheduled and 95 percent of vehicles will have PMs completed within the month that they are brought in.) Fleet also has goals for availability and vehicle downtime. Light vehicles (pickup trucks) have a 98 percent availability goal and heavy trucks have a 96 percent availability goal.

Small tool inventory and the spare parts and replacement equipment storage has been upgraded since 2008. The tool storage area is secured via locked gates and doors, with only management having keys. There are currently plans to assign a person to staff this area during regular working hours. A fence has been placed around the pipe storage area for security. Spare parts and equipment are tracked with Lucity. Lucity contains set points for reordering small parts and equipment.
Challenges:
• Adequate funding to replace equipment
• Documentation of repairs
• Maintaining equipment internally at a competitive rate to outside contractors
• Reliability of repairs

Opportunity:
• Synchronize Fleet management computer systems with Lucity.

Performance Measure(s):
• Availability rate of critical vehicles and field equipment

Supporting Documents (In Appendix):
• Fleet Service Agreement
• Active component list
• Equipment list
04 B  Collection System Map

Regulatory Expectation

*The wastewater utility must maintain a map of the collection system.*

**Lead Organizational Unit:** Management Section

**Summary Description:**

The Hampton wastewater collection system maps are in the GIS format. The Division currently has a staff of two persons to assure that the system map layers are kept accurate and up to date. Figure 5 presents a schematic of Hampton’s sanitary sewer system including the relationship to assets owned and operated by HRSD. The GIS maps are linked to the Division’s Lucity software. Figure 5 depicts the sewer system and Figure 6 depicts the service areas.

When field crews identify updates or revisions that are needed for the collection system map, they complete a map update form and turn that in to the GIS staff. The GIS staff makes the appropriate changes to the map in accordance with the map update procedure. The GIS staff is the only one who can make map changes. The field crews are diligent about submitting the changes in order to keep the maps up to date and to ensure accuracy with field verification. Many changes result from observations made by the Closed Circuit Television (CCTV) crews. Field crews have laptops with wireless connections in the field vehicles which enable them to have GIS available at all times.

All plans for new development go through the Division’s engineering staff. Since the engineering position is currently vacant, the Division director reviews all new plans. The Division still receives new development drawings in the form of paper copies and digital drawings.

The Division has not yet seen a need for attaching videos and pictures directly to the GIS because they are accessible through Lucity. Division staff regards that approach as more of a data warehousing issue. All maps have sub-meter accuracy for the x-y coordinates.

**Challenges:**

- Keeping the GIS information up to date
- Assuring that new development is entered accurately into GIS

**Opportunity:**

- *None identified at this time.*

**Performance Measure(s):**

- Time to complete map updates
- Number of completed map updates annually
Supporting Documents (In Appendix):

- Map Update Procedure
- Sewer System Map
- Pump Station Service Area Map
Figure 5  Sanitary Sewer System Map
Figure 6  Hampton Pump Station Service Areas
04 C  Management of Information

Regulatory Expectation

The wastewater utility should manage its relevant operation and maintenance information to establish and prioritize CMOM activities.

The proposed rule does not require that the information management system be computer based. However, for a system the size of Hampton’s, it is prudent that the information management system be computer based.

Lead Organizational Unit: Management Section

Summary Description:

The Division has a modern and comprehensive information management system. The proprietary software for the computerized maintenance management system is Lucity. The Division upgraded to Lucity in January 2014 to allow for wireless access by the field crews. The work order system is currently active but the integration of reporting capabilities are nearing completion.

Citizen requests for service are made through the City’s “311” System which uses a software system known as “Salesforce.” Lucity has a digital interface with Salesforce.

The Lucity information management system is readily available to the crews at their workstations and there is a screen available to all personnel that is located in a common area of the crew area. Stoppage trucks have computers with wireless access to Lucity for real-time entry. The new Lucity information management system also has improved data tracking and reporting capabilities which include:

- Number of connections
- Service calls – types, response time and follow up
- Labor hours- by category, direct vs. indirect
- Condition Standards
- Asset life cycles
- Lost work days
- Training and Certifications
- Tool Inventory, stock levels and accountability
Access Screen for Lucity

A screen for the SCADA network is located in the Pump Station Operations crew room, and a screen providing access to the GIS mapping system is located in the department ready room. These informational screens are directly accessible to all employees.

SCADA Home Screen

The SCADA system recently underwent a major overhaul. Initially intended to satisfy FCC compliance, the City took the opportunity to improve the system’s capabilities. Over a span of approximately two years, over $1 million was invested in creating a smarter, more efficient SCADA system. The primary component of this was the new ACE 3600 RTU, the “brain” unit
at each station. These units have the capability to transmit alarm status like the old system, but also have the ability to store-and-forward monitoring data. This is intended to eliminate costly parallel monitoring systems and condense all data into one source. This enables more data to be collected at all stations, improving the ability to comply with regulatory requirements. The home screen is set in a standard format with a block for each station. Digital alarm inputs are in smaller squares within the station block. Because all stations are shown on the home screen, this provides an “at-a-glance” review of system and alarm status. Clicking on a station’s block gives a visual representation of the station configuration (submersible, dry pit, etc.), as well as its current status. Station alarms and history can be reviewed here to provide more information about recent activity.

Interval data is being stored and transmitted back to the stations nightly. This information is accessed through a System Report screen. This screen was developed to take advantage of the new RTU’s capabilities to perform both alarming and recording functions.
SCADA System Reports Screen

Crew Room GIS Screen
Convenient access to the Lucity, SCADA and GIS information has proven to be very valuable to the staff. The convenience and ease of access provides significant time savings and improved accuracy in communications especially when responding to unscheduled maintenance calls.

**Challenges:**
- Assuring that resources expended entering necessary data into the information management system are used efficiently.
- Data and information updates are not logged. There is no formal tracking system to ensure that all data is entered and updates are made.
- The newest versions of GIS and Lucity have compatibility issues.
- The GIS has some data with location accuracy issues.

**Opportunity:**
- Develop a formal tracking system for data entry and map updates.

**Performance Measure(s):**
- Review/Update of Lucity CMMS

**Supporting Documents (In Appendix):**
- City of Hampton Public Works website (hyperlink)
- SCADA Operations Manual
04 D1  Gravity Line Cleaning, Inspection and Testing

Regulatory Expectation

As stated above in the introduction to Component 04, Measures and Activities, the EPA CMOM approach similarly and intentionally does not provide a great deal of detail for this functional area which was merely termed “D. Routine Preventive Operation and Maintenance Activities.” As before, the reason behind that approach is to allow each utility to develop and implement the appropriate preventive operation and maintenance activities specific to the needs of it wastewater collection system. For this report, the Routine Preventive Operation and Maintenance Activities component has been divided into seven appropriate and applicable subcomponents.

Standard industry practice includes the expectation that the gravity lines and appurtenances should be subjected to a routine program that includes cleaning, inspection and testing.

Lead Organizational Unit: Inflow and Infiltration Section

Summary Description:

The Division is implementing a three phased approach to gravity line cleaning, inspection and testing. The first program is the unscheduled or emergency maintenance program that is focused on addressing stoppages and overflows. The second program is high priority preventive maintenance which is accomplished through the “High Frequency Cleaning” program. Lastly, there is a system wide cleaning and CCTV program, termed the “Flow Area Program” that focuses on longer term gravity pipeline preventive maintenance and condition assessment activities.

Unscheduled / Emergency Maintenance

If the issue is a stoppage in the system, unscheduled maintenance can be initiated in several ways. Customers can call or email the City’s 311 Customer Call Center to report a sewer problem, or Division personnel can initiate a work order for unscheduled maintenance based upon field observations.

For the gravity system, the first responder is the Stoppage Crew which follows the procedure described in the document entitled, “Stoppage Process,” attached as a reference in Appendix section of this CMOM summary. At the conclusion of the stoppage call, the crew completes the “Stoppage Follow Up Spreadsheet,” presented in the Appendix.

Following restoration of service, the stoppage is characterized to determine the exact cause using CCTV. Additionally, a determination is made regarding: whether or not an immediate,
permanent, corrective repair should be made; whether or not the pipeline should be added to the high frequency preventive maintenance program; whether or not a remediation project should be designed and included in the capital improvement program; or some combination of these alternatives.

The primary causes of pipeline blockages, stoppages and overflows in the Hampton collection system are grease, roots, and debris. Unscheduled maintenance has the highest priority for regulatory compliance and customer service reasons.

**High Frequency Preventive Maintenance**

The High Frequency Preventive Maintenance (PM) program provides maintenance to gravity system assets based upon prior maintenance history. The locations are ones where the Division has responded to a stoppage, overflow or validated customer request. Based upon the actual situation, the type of maintenance activity and the frequency of that activity have been established. The list is comprised of 76 high frequency gravity main preventive maintenance locations and their associated cleaning schedule for calendar year 2014. On an annual basis, the program provides for the cleaning of 143,946 linear feet of gravity line. This program has the second highest priority.

**Flow Area or Long Term Preventive Maintenance**

The Flow Area assessment is the long term preventive maintenance and condition assessment program. It was initiated approximately ten years ago and provides for cleaning and evaluating one hundred percent (100%) of the gravity pipe system in each flow area. One wash truck and one CCTV truck are dedicated to regular cleaning and inspection activity. The Flow Area assessment can also include smoke testing if necessary.

All long term preventive maintenance has resumed since the completion of consent order SSES field activities. Eighty-eight flow areas were inspected between 2007 and 2011 under RCO work orders. A total of 1,999,156 LF of pipe was CCTV inspected and smoke tested, while 9,199 manholes were checked. Aerial crossings were inspected as part of the consent order activities.

The Division is currently using WinCan® as its CCTV inspection software. All of the City’s CCTV operators are trained and certified in NASSCO’s Pipeline Assessment and Certification Program (PACP®) and Manhole Assessment and Certification Program (MACP®).

Material removed from the sewer during cleaning activity is taken to a dewatering facility located adjacent to Wastewater Pumping Station 152.

There is an active program for maintaining off-street rights of way or easements through an agreement with the Sheriff’s Department. Easements around pump stations are maintained by a prison work crew. This crew can be used for clearing right-of-ways in emergency situations but
there is no current agreement for that work. The City’s Parks department can also be utilized for maintaining sewer easements on city property.

**Challenges:**
- Reach a performance level with associated programs so that unscheduled maintenance and high frequency preventive maintenance can be reduced and flow area or long term preventive maintenance can be increased.

**Opportunity:**
- Deploy flow meters and develop reports to measure the effectiveness of maintenance.

**Performance Measure(s):**
- Linear feet of pipe cleaned per month
- Linear feet of pipe televised per month
- Manhole checks performed per month
- Number of gravity main blockages per month
- Number of lateral stoppages on City property per month
- Number of lateral stoppages not on City property per month

**Supporting Documents (In Appendix):**
- 311 Hampton Stoppage Wastewater Form
- City of Hampton Stoppage Follow Up Report
- City of Hampton Stoppage Process
- Drying Bed SOP
- Mainline CCTV Inspection SOP
- Service Lateral CCTV Inspection SOP
- Smoke Testing SOP
- Vaccon Air Purge SOP
- High Frequency Gravity Main Maintenance Calendar
- Lateral Inspection Door Hanger
**04 D2 Root Management Program**

**Regulatory Expectation**

*Standard industry practice includes the expectation that the gravity lines and appurtenances should be evaluated for root problems and subjected to a routine program that includes inspection, evaluation and remediation.*

**Lead Organizational Unit:** Inflow and Infiltration Section

**Summary Description:**

Pipe segments subject to root problems that have led to sanitary sewer overflows or sewer blockages are part of the Division’s ongoing high frequency maintenance program. City crews use mechanical root cutters to clear lines. The city also has a chemical root control contract with an outside vendor. This lump sum contract is used to clear approximately 30,000 LF of pipe per year.

![Mainline Root Cutter](image)

**Challenges:**
- Roots are a significant contributing cause of blockages, stoppages and sanitary sewer overflows
- Eliminating roots mechanically is not an effective long term solution since the roots can grow back rapidly and thicker
- Repairs of root damaged pipes must occur quickly in order to maximize the efficiency of chemical and mechanical control methods

**Opportunity:**
- Utilize the upcoming Annual Services contract to maximize efficiency of control methods.

**Performance Measure(s):**
- Linear feet of chemical root treatment per year
- Linear feet of mechanical root cleaning per year
- Number of root associated sanitary sewer overflows per month

**Supporting Documents (In Appendix):**
- Root Cut Lateral SOP
- Root Cut Main Line SOP
04 D3  Gravity Line Chemical and Biological Treatment

Regulatory Expectation

*Standard industry practice includes the expectation that the gravity lines, pump stations and appurtenances should be subjected to a program for addressing issues such as root problems, grease problems, calcification, corrosion and odors that can impact system reliability and customer service level and can be addressed through the application of chemical and/or biological treatment.*

**Lead Organizational Unit:** Inflow and Infiltration Section

**Summary Description:**

The city’s FOG ordinance and sewer ordinance explicitly say no chemical or biological treatment is to be used unless approved. The Wastewater Operations department uses a chemical treatment called Jet Power II®. This is currently the only approved system to assist in cleaning pipe segments subject to heavy grease deposition caused by non-compliers. The product is also used in certain sewer segments to reduce the redevelopment of grease deposits. A one percent solution is applied to the grease in the gravity line by the jetter during the cleaning operation. The solution is allowed to sit for approximately ten minutes to soften the grease before the jetter nozzle is pulled back through the line to remove the grease.

With this system the Jet Power II® is metered and injected into the VacCons water system downstream of the water pump. The operator is able to adjust the amount of chemical that they use based upon the level of deposits.

Jet Power II® injector systems are installed in all four wash trucks. Lines that require regular applications are included in the High Frequency PM program. The City has seen a decrease in grease deposits where Jet Power II® has been used previously.

**Challenges:**

- The use of chemicals to control grease and roots in the gravity lines is resource consuming.

**Opportunity:**

[Truck mounted Jet Power II® injector system]
• Deploy flow meters and develop reports to measure the effectiveness of Jet Power II®.

**Performance Measure(s):**

- Linear feet of Jet Power II® treatment per year
- Number of FOG associated sanitary sewer overflows per month

**Supporting Documents (In Appendix):**

- Jet Power II® specifications and usage
- Chemical Root Control Program
04 D4  Gravity Line Construction and Repair

Regulatory Expectation

*Standard industry practice includes the expectation that the utility will have the equipment and personnel available to make emergency point repairs. This capability can be in-house, stand-by contract or a combination of the two.*

**Lead Organizational Unit:** Construction Section

**Summary Description:**

Most construction work on the collection system is done by the Construction Section. The Construction Section is comprised of two crews, each of whom can undertake the projects assigned. These projects generally relate to gravity system repairs, relocation of sewer lines from alleyways or extending sewer service into areas currently served by septic tanks. The Section is responsible for projects through completion including landscaping, topsoil, etc.

All asphalt and concrete repairs are conducted under contract with an outside vendor. This includes the associated repairs of streets and sidewalks. Pipe laying and pipe repair projects are limited to ten foot depth.

All construction repairs on gravity mains and laterals are televised. Once the repair is completed, a task is added to the work order for follow up CCTV inspection. These videos are then given to the Construction Manager for review.

Hampton has awarded an Annual Emergency Construction Services contract for emergency repairs to two outside companies in late 2014. This contract is intended to supplement the work performed by the Construction Section. Hampton is also preparing an annual demand services contract for pipe lining and replacement and plans to award contracts to two outside companies by mid-2015. This contract is also intended to supplement the work performed by the Construction Section.

**Rehabilitation and Replacement Actions**

An annual contract is in place for CIPP lining with an outside vendor. Currently, a contract of $150,000 per year can be utilized to rehabilitate identified portions of the system ranging from 8-inch to 15-inch diameter pipe.

The Department currently has a budget of $75,000 a year which can be used to hire a subcontractor to rehabilitate manholes. At a cost of $135 per vertical foot, approximately 100 manholes can be rehabilitated annually with this funding.
The Construction Section is also responsible for raising manholes to grade when needed. When street paving projects are planned, coordination with the Streets Division is required to raise impacted manholes to grade.

**Challenges:**
- Skilled labor is difficult to attract.
- Experienced equipment operators are often hired away by other Public Works divisions.
- Gravity line construction and repair increases the Division’s risk liability.
- Small projects and repairs are not inspected for conformance to City Construction Standards.

**Opportunity:**
- Utilize existing and upcoming contracts to make proactive repairs.
- Utilize new Inspector position to maintain quality across all projects.

**Performance Measure(s):**
- Number of gravity main pipes repaired or replaced per year (based on emergency repairs and emergency contracts)
- Number of manholes rehabilitated or replaced per year (based on emergency repairs and emergency contracts)
- Annual gravity system repair or replacement construction costs (based on emergency repairs and emergency contracts)

**Supporting Documents (In Appendix):**
- HRPDC Standards – Division 8 (hyperlink)
- City of Hampton Design and Construction Standards (hyperlink)
- Manhole Adjust-Replace Frame and Cover SOP
- Manhole Rehab SOP
- Manhole Rehab Detail Report
- Manhole Rehabilitation Processes
- NASTT article – Manhole Rehab in Virginia
04 D5  Pump Station Maintenance and Operation

Regulatory Expectation

Standard industry practice includes the expectation that the pumping stations and their appurtenances should be subjected to a routine program that includes preventive maintenance of rotating equipment; preventive maintenance of electrical panels and program logic controllers; wet well maintenance and cleaning; building and yard maintenance; and planned routine and emergency operations.

Lead Organizational Unit: Pumping Station Section

Summary Description:

The Division has an extensive pumping station unscheduled and scheduled preventive maintenance program for its 108 pumping stations. Some stations are suction lift; some are submersible; but, most are flooded suction with wet/dry wells. There are 14 variable speed stations that are connected to the HRSD system. High pressures occur in the HRSD system during rainfall events. The Division has nine backup diesel pumps that are permanently mounted at key stations. These are currently all manufactured by Godwin Pumps. There are also 16 portable pumps for use at other locations when needed.

The pump station unscheduled and preventive maintenance programs are managed through the Lucity asset management program. About half of the stations have been rehabilitated during the last 20 years.

Pumping station maintenance activities are divided into three categories: mechanical, electrical and electronic. Additionally, all of the wet wells are cleaned at least once per year. Most are cleaned twice per year to remove grease, accumulated solids and debris. The material is taken to a dewatering location adjacent to Pump Station 152. Preventive maintenance work orders are reported out of Lucity on a monthly basis and distributed to the crews on a daily basis. Additionally, all of the work to be done during the day is discussed the previous evening or first thing in the morning.

The routine preventive maintenance activities originally set up based upon the manufacturers’ requirements but have since been modified, as appropriate, to be specific to the individual stations and their operating conditions. When the monthly work is completed early, the crews work the general care and cleaning of the pumping stations.

Unscheduled pumping station maintenance occurs infrequently. When pumping station problems were on

Replacing a pump seal at Pumping Station 104
crews in the field, corrective action is scheduled through Lucity. Work orders can be generated manually in Lucity when necessary.

Most of the pumping stations are included in a SCADA system. The SCADA system is monitored in the shop area of the North Back River Road facility. Alarm status can also be monitored remotely via a text-message based 411 system. Data from most pump stations include flow, starts and stops, run times, security, high water, pump fail, RTU failure, flow meter and power failure. Data taken from the SCADA system are also used to indicate maintenance needs or trends in operating regimes. The maintenance of the SCADA network is outsourced to an external contractor. All pumping stations have accurate as-built drawings and/or schematics.

The pump run times and starts and stops are monitored routinely. Run times are checked daily. That activity takes about 30 minutes each day. Draw down tests are run at each of the pumping stations on a routine basis, usually annually.

There is always an electrician and a mechanic assigned to on-call duty. The alarm pages the on-call employee. If that person does not respond, the system continues paging until a response is provided.

Challenges:
- Grease and rags are a problem both for the pumps and wet wells.

Opportunity:
- Purchase hand held computing devices with drop down menus for the pump station maintenance staff to document activities.
- Utilize upgraded SCADA system and reports to measure the effectiveness of maintenance.

Performance Measure(s):
- Number of pump station Preventive Maintenance (PM) activities performed monthly
- Pump station pump failures per year
- Number of pump station related SSOs per year
- Annual pump station equipment repairs or replacement costs (Emergency Repairs & Emergency Contracts)

Supporting Documents (In Appendix):
- Pump Station Listing
- Critical Pump Station Information
- Pump Station Electrical PM Checklist
- Pump Station PM Checklists
- Pump Draw Down Test form
- Pump Station PM Schedule Board
- SCADA Operations Manual
04 D6 Force Main Maintenance

Standard industry practice includes the expectation that force mains and appurtenances should be subjected to a routine program that includes preventive maintenance of air release valves and inspection or rights of way and aerial crossings.

Lead Organizational Unit: Pumping Station Section

Summary Description:

The pressure system maintenance performed by the Division includes a valve maintenance and exercise program at the pump station sites and air release valve maintenance and replacement program. The system includes approximately 40.5 miles of primary force mains, 8 miles of secondary force mains, 105 air release valves and 233 gate valves. The program for maintaining these assets are managed through the Lucity asset management system. Force mains and air release valves were inspected as part of the RCO. They are currently inspected annually as part of preventative maintenance activity. Aerial crossings are inspected annually.

The work orders direct maintenance staff with information that includes valve location and the number of turns required to properly exercise each valve. Most valves are exercised concurrently with the routine pumping station preventive maintenance program. Valves located away from the pumping stations are not exercised.

Most easements have been identified by wastewater survey staff. These easements are maintained by agreement with the City Sheriff’s Department and Parks Department.

Challenges:
- The internal and external condition of force mains is unknown for the most part.
- Grease and rags are a problem for valves.

Opportunity:
- Initiate a force main right of way and easement maintenance program.
- Expand the valve maintenance program to include the remainder of the system.

Performance Measure(s):
- Number of air release valves inspected and maintained per year
- Number of gate valves inspected and exercised per year
- Percentage of aerial crossings inspected per year
- Annual forcemain repairs costs (Emergency Repairs & Emergency Contracts)

Supporting Documents (In Appendix):
- None
04 D7  FOG Management Program

Standard industry practice includes the expectation that every sewer utility will have in place and be implementing a comprehensive fat, oils and grease (FOG) management program. A comprehensive program provides for legal authority, registration/permitting, acquisition of source attributes, mapping, inspection, enforcement, information management, internal communication and public information.

Lead Organizational Unit: Inflow and Infiltration Section

Summary Description:

The City of Hampton adopted a FOG ordinance in January 2010. The ordinance is the same as the ordinances adopted by other Hampton Roads localities. The FOG Coordinator will be responsible for the ongoing development and implementation of the FOG management program.

There are an estimated 400 food service establishments in the City of Hampton.

Challenges:
• Data collection to effectively enforce non-compliance with the FOG ordinance
• The City’s ordinances do not specifically address the issue of controlling fats, oils and greases (FOG) from multi-family residential and other residential properties
• High turnover of restaurant personnel requires a high frequency of educational activities

Opportunity:
• Utilize increased regional awareness of FOG programs to improve public outreach.

Performance Measure(s):
• Number of food service establishment inspections per year
• Number of FOG violations written per year
• Number of civic meeting FOG education programs per year

Supporting Documents (In Appendix):
• FOG Ordinance (hyperlink)
• FOG Coordinator’s Job description
04 E  Current System Capacity

Regulatory Expectation

*The wastewater utility must have in place a program to assess the current capacity of the collection system and treatment facilities that it owns or over which it has operational control.*

*To fulfill this regulatory expectation, the City must address capacity issues for both the gravity system and the pressure system. Of particular concern are the system pressures that the City’s pump stations have to overcome to connect to the regional manifled force main network.*

Lead Organizational Unit: Management Section - Engineering

Summary Description:

Hampton has its own standards that were last revised in 1995. The City also has Design and Construction Standards which were updated in 2012.

The capacity of the City of Hampton sewer system is currently determined through the use of the system-wide hydraulic model and engineering calculations in cooperation with HRSD. The models were initially calibrated to City flow meter data in November 2010. A combination of City and HRSD flow meter data was used to support Regional Hydraulic Model (RHM) calibration and Locality model calibration in July 2012. The Locality Amended Capacity Assessment of January 2013 is based on this updated data and is currently considered the most accurate representation of system capacity. The Amended Capacity Assessment identified locations in the city that experienced surcharging within 1.5 feet of manhole rim elevations. This analysis was performed under dry weather, 2030 population conditions and for rainfall events representing the 2-, 5-, and 10-year statistical peak flow recurrence events. Out of the 107 analyzed service areas in the city, the City’s Amended Capacity Assessment identified multiple service areas that had portions of the upstream collection system that experienced simulated overflows or surcharging defined as excessive. All freeboard level exceedence (FLE) structures were analyzed for probable cause of the issue. Table 5 and Table 6 outline these results and a full list of the identified structures is included in the appendix of the Amended Capacity Assessment.

| Table 5 Summary of Capacity Assessment Simulation Results – Service Area Counts |
|------------------------------|-----|-----|-----|-----|
| Simulated Overflow | 0 | 1 | 7 | 12 |
| Freeboard Criterion Not Met | 20 | 24 | 21 | 21 |
| No Simulated Issues | 87 | 82 | 79 | 74 |
Table 6 Preliminary Evaluation of Cause of Freeboard Level Exceedence or Overflow

<table>
<thead>
<tr>
<th>Service Area</th>
<th>Applicable Analysis Category or Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Downstream Level</td>
</tr>
<tr>
<td>3</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>7</td>
<td>Collection System</td>
</tr>
<tr>
<td>11</td>
<td>Shallow Structure and Collection System</td>
</tr>
<tr>
<td>14</td>
<td>Collection System</td>
</tr>
<tr>
<td>17</td>
<td>Pump Station</td>
</tr>
<tr>
<td>23</td>
<td>Collection System</td>
</tr>
<tr>
<td>27</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>30</td>
<td>Shallow Structure, Pump Station, Collection System</td>
</tr>
<tr>
<td>32</td>
<td>Pump Station</td>
</tr>
<tr>
<td>33</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>48</td>
<td>Collection System</td>
</tr>
<tr>
<td>102</td>
<td>Shallow Structure and Collection System</td>
</tr>
<tr>
<td>105</td>
<td>Pump Station</td>
</tr>
<tr>
<td>106</td>
<td>Collection System</td>
</tr>
<tr>
<td>113</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>119</td>
<td>Collection System</td>
</tr>
<tr>
<td>121</td>
<td>Downstream Pressure</td>
</tr>
<tr>
<td>123</td>
<td>Downstream Pressure</td>
</tr>
<tr>
<td>127</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>131</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>132</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>134</td>
<td>Collection System and Downstream Pressure</td>
</tr>
<tr>
<td>140</td>
<td>Downstream Pressure</td>
</tr>
<tr>
<td>141</td>
<td>Downstream Pressure</td>
</tr>
<tr>
<td>203</td>
<td>Downstream Level, Shallow Structure, Collection System</td>
</tr>
<tr>
<td>204</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>206</td>
<td>Shallow Structure</td>
</tr>
<tr>
<td>208</td>
<td>Downstream Level, Shallow Structure, Collection System</td>
</tr>
<tr>
<td>217</td>
<td>Downstream Level</td>
</tr>
<tr>
<td>219</td>
<td>Shallow Structure and Downstream Level</td>
</tr>
<tr>
<td>223</td>
<td>Downstream Level, Shallow Structure, Collection System</td>
</tr>
<tr>
<td>225</td>
<td>Shallow Structure</td>
</tr>
</tbody>
</table>
The five categories of probable cause of exceeding the allowable freeboard level are:

1. **Collection System Limitation**: The flow projected to go through a gravity pipe is more than the pipe can convey, causing an overflow upstream of that pipe.
2. **Pump Station Limitation**: All station pumps are operating at or near maximum rates, but the amount of flow trying to get to the pump station exceeds the amount that the pumps can deliver.
3. **Downstream Pressure Limitation**: Pump stations are operating, but at diminished flows (approximately 50% of normal operations) due to elevated pressures in the force main system.
4. **Downstream Level Limitation**: Hampton has extensive gravity main connections to HRSD gravity interceptor mains. Many of the Hampton manholes have rim elevations below the HRSD manhole rim.
5. **Shallow Structure**: Given the flat topography of much of the city, some pipes in the service area are buried with less than optimal cover. This is especially true in locations where service was extended to outlying parcels along the waterways. These manholes are very shallow, and therefore may exceed the freeboard limits of the RTS under normal operations while not surcharging the pipes connected to the structure. These structures are not considered capacity-related deficiencies.

The City’s ongoing flow monitoring program will provide additional data across the city. Updated flow information can be incorporated into the models as development progresses and rehabilitation efforts are completed.

Capacity in the force main system is currently based on the existing SCAT regulations on minimum and maximum velocities. Capacity is evaluated as repair or replacement work is performed for each force main. Criteria under consideration for future force main analyses are average velocity, maximum velocity, pressure, and headloss.

**Challenges:**
- The Level of Service has not been selected for the Regional Wet Weather Management Plan
- The party responsible for capacity upgrades under the terms of the SOC is under discussion
- The party responsible for capacity upgrades as part of the RWWMP is also under discussion

**Opportunity:**
- Utilize Hybrid Regionalization approach and coordination meetings with HRSD to make additional system improvements.

**Performance Measure(s):**
- Months of flow monitoring activity per year, measured in meter-months
- Hydraulic model updates to reflect system improvements

**Supporting Documents (In Appendix):**
- Hampton Design and Construction Standards (hyperlink)
- Hampton Amended Capacity Assessment
04 F  Identify and Prioritize Structural Deficiencies

Regulatory Expectation

The goal of every wastewater utility should be to reduce corrective and emergency maintenance through the use of planned and predictive maintenance.

Lead Organizational Unit: Inflow and Infiltration Section

Summary Description:

There are 108 flow areas in the city. SSES field activities for the 2007 Regional Consent Order were completed in November 2011 in 88 flow areas. Chapter 6.0 of the Amended SSES Plan of July 2010 outlines the thorough approach that the City takes with its field SSES work. A total of 1,999,156 LF of pipe was CCTV inspected and smoke tested while 9,199 manholes were checked. Between November 2011 and June 2014, CCTV pipe inspections were performed on the remaining 20 flow areas in the city.

Identification of Structural Deficiencies

All assets identified as having PACP® level 5 problems are addressed through a “Prompt Repair” find and fix program. The City’s Lucity asset management system has the capability to import defects and scores for individual pipe segments from the current version of WinCan® CCTV inspection reports. A pipe criticality analysis has been initiated to address the prioritization of repairs of all defects. The results of this analysis will be incorporated into the city’s Lucity asset management system. Work orders will be created based on the information entered and repairs can be tracked.

Extent of Identified System Rehabilitation Needs

Draft Rehabilitation Plans for 91 service areas identified through the 2007 Regional Consent Order activities were completed prior to being placed on hold with the signing of the Hybrid Regionalization agreement. Service-area level rehabilitation plans are not required under the 2014 Consent Order so the plans were not finalized. These draft plans identified approximately 1,100,000 linear feet (LF) of gravity sewer, 3,000 gravity manholes, and 6,000 linear feet of sewer force main for rehabilitation or replacement. The cost of this system-wide effort was expected to reach approximately $160 million.

Prioritization of Repairs

The Regional Consent Order’s shift to a Hybrid Regionalization approach has changed the requirements of the City. Capacity improvement projects are projected to be the responsibility of HRSD. The City will be responsible for the repair and renewal of infrastructure.
Efforts have begun to develop criteria that score the Probability of Failure and the Consequence of Failure for each gravity pipe segment. The scoring and preliminary ranking of pipe segments is expected to be complete in 2015. These criteria may change as the responsibilities of localities and HRSD are more clearly defined in the Hybrid Regionalization Approach and the updated Regional Consent Order. These ranking criteria will generate a Business Risk of Exposure score for each gravity pipe segment in the city. When combined with the City’s extensive SSES information, repairs can be prioritized for defects that are not in the Prompt Repair program. This effort is expected to separate immediate budgetary needs from long-term budgetary needs. Ongoing projects and projects under design are included in the Annual Report.

Challenges:
- Regional coordination under the Hybrid Regionalization Approach
- The party responsible for capacity upgrades under the terms of the SOC is under discussion
- The party responsible for capacity upgrades as part of the RWWMP is also under discussion

Opportunity:
- Utilize new RCO to prioritize repairs to lessen immediate impact to Hampton rate payers.

Performance Measure(s):
- Review of PACP CCTV inspections performed each year.

Supporting Documents (In Appendix):
- Amended SSES Plan of July 2010
- Manhole Assessment and Rehab Program
- Division’s Updated Wastewater Strategic Plan 2013-2019
04 G  Appropriate Training

Regulatory Expectation

The wastewater utility must have an appropriate training program on a regular basis.

Lead Organizational Unit: Management Section and Management Team

Summary Description:

Division personnel bring their management, operation, and maintenance knowledge with them when they are initially employed. On-the-job training is used to provide system knowledge for new hires through an informal program. SOPs are also used as part of the training process. These SOPs can be found in the Appendix to this document.

All employees receive appropriate formal safety training and refresher training in areas such as safety flagging, traffic control, trenching and shoring and confined space entry. Safety meetings are held monthly on a variety of safety topics. This program includes a listing of needed safety training topics and personnel who require training. All training is tracked in Lucity and by the Safety Officer.

All necessary employees have received training in the NASSCO Pipeline Assessment and Certification Program (PACP) and Manhole Assessment and Certification Program (MACP). Personnel are also receiving job related training on the Lucity information management system and on GIS.

Electricians need four CEUs to recertify their license each year. The Division pays for that training or any training that is required to meet job related certification requirements. Employees are encouraged to participate in the California State University of Sacramento Operation and Maintenance of Wastewater Collection Systems program, an independent self-study training program. The City also provides supervisory training through Human Resources. On occasion, the City provides training by outside vendors. Further, the City will reimburse for college training, if it is job related.

Challenges:
• As with all utilities, it is difficult to find and expend the resources required (time and money) to support staff training. It is also difficult to provide networking opportunities for staff.

Opportunity:
• None identified at this time.

Performance Measure(s):
• Safety training hours per employee
• O&M training hours per employee
Supporting Documents (In Appendix):

- Refer to available SOPs from this document and Appendix
05 A-B  Design & Performance Standards

Regulatory Expectation

• The utility must establish requirements and standards for the installation of new sewers, pumps and other appurtenances; and
• Procedures and specifications for inspecting and testing the installation of new sewers, pumps and other appurtenances and for rehabilitation and repair projects.

Lead Organizational Unit: Management Section - Engineering

Summary Description:

The City of Hampton has adopted the sewer design and performance standards that have been regionally established and that are coordinated by the Hampton Roads Planning District Commission (HRPDC) of which the City is a member. These standards can be found on the internet. Sewer related standards can be found in Division 8 Water and Wastewater Utilities:

Section 800 - Table of Contents
Section 801 - Water Distribution Systems
Section 802 - Sanitary Gravity Sewer Systems
Section 803 - Sanitary Force Main Systems
Section 804 - Boring and Jacking
Section 805 - Separation of Water Mains and Sewers
Section 806 - Horizontal Directional Drilling
Section 810 - Sewer Line Cleaning
Section 811 - Television Inspection
Section 812 - Bypass Pumping
Section 813 - Pipe Rehabilitation by Cured-in-Place Method
Section 814 - Pipe Rehabilitation by Cured-in-Place Method
Section 816 - Sewer Pipe Joint Testing
Section 817 - Chemical Grouting
Section 818 - Point Repair by Excavation
Section 819 - Insitu Structural Point Repair
Section 820 - Insitu Point Repair by Sectional Lining
Section 821 - Sanitary Sewer Service Reconnections
Section 822 - Manhole Rehabilitation

Inspections of work by outside contractors can be found in Division 1, General Provisions, and in particular Sections 105 and 106:

Section 105 - Control of Work
I.  Reuse of Contract Documents
II. Copies of Contract Documents
III. Contract Documents
IV. Shop Drawings and Submittals
V. Record Drawings
VI. Access to Project
VII. Surveys and Reference Points
VIII. Working Hours
IX. Project Coordination
X. Supervision
XI. Uncovering Work
XII. Removal of Unacceptable Work
XIII. Substantial Completion
XIV. Use of Completed Portions
XV. Final Inspection
XVI. Claims
XVII. Engineer's Status
XVIII. Documentation of Preconstruction Conditions
XIX. Notice to Comply Order
XX. Stop Work Order

Section 106 - Control of Material
I. Tests and Inspections
II. Labor, Materials and Equipment
III. Work by Owner

In conjunction with the regional standards, the City of Hampton also uses its own Design and Construction Standards. In June 2012, new revisions to the City of Hampton Design and Construction Standards were adopted. This document is for use of all public improvements in the City of Hampton, including sewers, pumps and appurtenances. The revised document aligned the standards with VDOT and ADA requirements as well as the following collection system changes:

- A revised air vent assembly for sanitary sewer force mains
- Two new sanitary sewer force main connection details

The following sewer related details are listed in the Design and Construction Standards:

- Air Vent Assembly
- Brick Shallow Sanitary Manhole
- 2” Force Main Connection
- 4” Force Main Connection
- Manhole Frame and Cover
- Pipe Bedding
- Precast Sanitary Manhole

Construction inspection of new or replaced sewers will be performed by an internal inspector. This person will be part of the Inflow and Infiltration group within the Division. The City of Hampton Community Development department and the Development Services Center handles permits, planning, zoning, site plan review, and other construction inspection services.
Challenges:
• Assuring that the regional design and performance standards are enforced by the City and the Department of Public Works.

Opportunity:
• Establish sufficient Infrastructure Inspector positions to maintain quality on concurrent construction projects.

Performance Measure(s):
• Review and Inspections of Division construction projects
• Review and Inspections of Contractor construction projects

Supporting Documents (In Appendix):
• HRPDC Regional Construction Standards (hyperlink)
• City of Hampton Design and Construction Standards (hyperlink)
• City of Hampton Community Development website (hyperlink)
06 A-C Monitoring, Measurement and Program Modifications

Regulatory Expectation

The wastewater utility must:

• monitor the implementation and, where appropriate, measure the effectiveness of each element of the utility’s CMOM program;
• update program elements as appropriate, based on monitoring or performance measures; and
• modify the summary of its CMOM program as appropriate to keep it updated and accurate.

Lead Organizational Unit: Management Section and Management Team

Summary Description:

The Division is developing a formal process for monitoring and measuring CMOM program effectiveness and for subsequently making appropriate modifications to the individual programs. That formal process will include the Performance Measures developed during the preparation of the CMOM summary. The Division’s current process for carrying out this activity is to conduct routine meetings of senior managers and field supervisors. As a small and flat organization, this process has been effective for the Division to date but with planned enhancements to the Lucity information management system, the process can become more focused.

Challenges:

• The Division’s personnel are currently fully engaged in the daily management, operation, and maintenance of the wastewater collection system. There is an additional workload associated with complying with the SOC. Implementing an expanded continuing improvement process will require a modest level of additional resources.
• Updating SOPs and procedures on a regular basis

Opportunity:

• Continue a program that monitors the effectiveness of and updates SOPs.

Performance Measure(s):

• Prepare an annual CMOM summary update
• Perform an annual CMOM Program Audit
• Review Performance Measures annually

Supporting Documents (In Appendix):

• none
07 A-E  Sanitary Sewer Overflow Response Plan (SSORP)

Regulatory Expectation

The utility must develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment. The plan must include mechanisms to:

• Ensure that the utility is made aware of all overflows (to the greatest extent possible),
• Ensure that overflows (including those that do not discharge to waters of the U.S.) are appropriately responded to, including ensuring that reports of overflows are immediately dispatched to appropriate personnel for investigation and appropriate response,
• Ensure appropriate immediate notification to the public, health agencies, other municipal entities (e.g., water suppliers) and the NPDES authority (FDEP). The CMOM program should identify the public health and other officials, who will receive immediate notification,
• Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained, and
• Provide emergency operations.

Lead Organizational Unit: Management Section and I/I Section

Summary Description:

The City of Hampton records all spills, regardless of size. SSOs that are 100 gallons or greater or those that reach State Waters regardless of size are reported in the SSORS (Sanitary Sewer Overflow Reporting System) database. The attributes reported in SSORS include:

• Reported Date
• Possible Receptors
• Site Address
• SSO Classification
• Description of Incident
• Date of Incident
• Spill Duration
• Corrective Action
• Quantity Units
• Amount Recovered
• Amount Reaching State Waters

The Division has completed an annual update of its SSORP for any needed changes for improvement. Division personnel are trained on the SSORP. SSO event information is reviewed and evaluated to determine if the specific location should be included for placement on the high frequency cleaning list, whether an immediate point repair is warranted or whether a project should be added to the capital improvement program. The same information is evaluated to determine whether or not CMOM programs should be modified in some manner to further reduce the probability of a future SSO anywhere in the system.
Quarterly meetings are held with HRSD operations staff to discuss operation issues, consent order issues, HRSD facilities, and City of Hampton facilities. The City has informal mutual aid program with HRSD. Equipment is shared, efforts are coordinated in emergency situations, and communication is frequent and unrestricted. The City also has informal mutual aid program with the City of Newport News. Efforts are coordinated in emergency situations and communication is frequent and unrestricted.

There is no formal program for assistance after natural disasters, but the City of Hampton has helped out other municipalities in the past when requested.

**Challenges:**
- The Hampton service area is adjacent to and surrounded by recreational and shellfish waters.

**Opportunity:**
- Maintain membership in the Virginia WARN network.
- Review critical assets.
- Review and update contingency response plans for critical assets that are identified as high risk assets, that is, reasonable probability of or high level of consequence of failure.

**Performance Measure(s):**
- SSORP reviewed and updated annually
- Hold refresher training for Division personnel at least semi-annually.

**Supporting Documents (In Appendix):**
- FY 2010 – 2014 Regional Consent Order Annual Reports
- Sanitary Sewer Overflow Emergency Response Plan
- Overflow Response Chart
- Overflow Response SOP
- Stoppage SOP
- Stoppage Crew WO Summary
- Stoppage Crew Manual
08 A-C System Evaluation and Capacity Assurance Plan

Regulatory Expectation

The utility must prepare and implement a plan for system evaluation and capacity assurance if peak flow conditions are contributing to an SSO discharge or to noncompliance at a treatment plant, unless the utility has already taken steps to correct the hydraulic deficiency or the discharge meets the criteria of paragraph (f)(2) [discharge was caused by a severe natural condition] of this section. At a minimum the plan must include:

(A) Evaluation. Steps to evaluate those portions of the collection system which the Utility owns or over which the Utility has operational control and which are experiencing or contributing to an SSO discharge caused by hydraulic deficiency or to noncompliance at a treatment plant. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, provide estimates of the capacity of key system components, identify hydraulic deficiencies (including components of the system with limiting capacity) and identify the major sources that contribute to the peak flows associated with overflow events.

(B) Capacity Enhancement Measures. Establish short- and long-term actions to address each hydraulic deficiency including prioritization, alternatives analysis, and a schedule.

(C) Plan Updates. The plan must be updated to describe any significant change in proposed actions and/or implementation schedule. The plan must also be updated to reflect available information on the performance of measures that have been implemented.

Lead Organizational Unit: Management Section - Engineering

Summary Description:

As required by the 2007 VDEQ SOC, the City of Hampton has prepared and submitted the following documents in support of system capacity evaluations:

- City of Hampton SSES Plan, December 2008
- City of Hampton Amended SSES Plan, June 2010
- City of Hampton Flow Evaluation Report, May 2009
- City of Hampton Amended Flow Evaluation Report, March 2010
- City of Hampton Preliminary Capacity Assessment, July 2012
- City of Hampton Amended Capacity Assessment, January 2013

This extensive work laid the foundations for identifying system capacity restrictions in the city. With the creation of the Hybrid Regionalization approach outlined in the January 2014 MOA and the elimination of the Regional Technical Standards in the revised VDEQ SOC of 2014, wet
weather capacity is the responsibility of HRSD. Development capacity remains in the scope of city sewer systems.

Evaluation:
Eighty percent of Hampton has been developed, so evaluation of future capacity and hydraulic deficiencies must consider redevelopment activity. This is a major issue since there are areas where the existing infrastructure will not support flow increases typically associated with redevelopment. Additionally, within Hampton, HRSD maintains several gravity lines. While these structures are not within Hampton’s operational control, they have a significant impact on the capacity of the connecting city-owned gravity collection system.

Evaluation of capacity-related overflows is performed using the system hydraulic model in conjunction with the Regional Hydraulic Model. Estimates of the peak flows were developed from the past flow monitoring activities and the current ongoing efforts. SSO flows are estimated by field personnel using established techniques and were compared to modeled overflows during model calibration efforts. Estimates of capacity and hydraulic deficiencies in the current system were presented in the Amended Capacity Assessment of 2013. SSES field activities help to identify the sources contributing to peak flows.

Capacity Enhancement:
The system hydraulic model allows for alternatives to be entered for analysis. Different pumping setups, collection system properties, etc. can be entered and the resulting system performance can be compared for any given wet weather event. These can be used to identify the effectiveness of solutions to address the hydraulic deficiencies. Larger solutions that may require HRSD involvement will be worked out in conjunction with the Regional Wet Weather Management Plan. The Hybrid Regionalization plan currently places the majority of the wet weather capacity requirements under the jurisdiction of HRSD, while smaller capacity enhancements may be performed by the city. The delineation between projects is still under discussion and will be resolved with the submittal of the RWWMP under the revised VDEQ SOC and HRSD’s revised Federal Consent Decree.

Plan Update:
The city wastewater system hydraulic models will be updated as systems are repaired or extended. Ongoing flow monitoring will be used to gather information on system performance to provide the basis for model flow parameter updates. Current coordination schedules indicate that the Regional Hydraulic Model will be updated on a regular basis to continue to assess capacity within the Regional Sanitary Sewer System. These updates will help assess capacity within the city system by providing updated boundary conditions.

Capacity for Development

The division reviews all planned and new connections to assure that there is adequate capacity available to handle the anticipated additional flows. The Director, the City Planning Department, or a contracted engineer currently performs the capacity reviews. New projects are analyzed using the system hydraulic models already calibrated for capacity assessment. The additional flows from the proposed development are calculated in accordance with VDEQ SCAT
regulations and checked against HRSD’s 2015 Regional Sewage Flow Projection table/procedure. The review evaluates the increase in hydraulic grade lines in gravity pipes to determine the potential for surcharging of pipes. Analysis of the pump station includes a comparison of peak flows, extended run times, pump operating point, and any projected surcharging in the wet well.

All reviews are to be tracked in Lucity through the pump station asset. Documentation supporting the analysis will be attached to the work order created. This process will allow for tracking the status of development/connection requests from initial request to construction.

When the Level of Service is selected as part of the RWWMP, it is expected that new/rehabilitated pump stations will be designed to operate at the projected conditions during wet weather events for the selected level of service and proposed system improvements. Gravity mains will be sized to convey the selected peak flows without violating excessive freeboard criteria. Deficiencies identified at existing pump stations analyzed during the Capacity Assessment portion of the VDEQ SOC are anticipated to be addressed by HRSD in the Regional Wet Weather Management Plan.

Challenges:
- The Level of Service has not been selected for the Regional Wet Weather Management Plan
- The party responsible for capacity upgrades under the terms of the SOC is under discussion
- The party responsible for capacity upgrades as part of the RWWMP is also under discussion

Opportunity:
- None identified at this time.

Performance Measure(s):
- Complete capacity analysis of all proposed sewer connections

Supporting Documents (In Appendix):
- Hampton Amended Capacity Assessment Report
- System Development Capacity Evaluation Form
- HRSD Regional Sewage Flow Projection
09 Consent Order Annual Report

Regulatory Expectation

The city, as a part of its efforts to maintain transparency with Virginia DEQ and follow best industry practices, will prepare an annual report even though it is not a requirement of the new Consent Order. The Report shall reflect all work activities performed during the previous fiscal year and shall include a summary of the sanitary sewer system benefits achieved during the year. The report shall be prepared on or before September 1 following the close of each fiscal year to be available for MS4 Permit compliance report.

Lead Organizational Unit: Management Section and Management Team

Summary Description:

This 2015 CMOM update of the 2010 CMOM Program has documented the current CMOM program and any updates performed since its approval. The Division will continue to make appropriate program improvements on a continuing basis and document the upgrades through the Annual Report required by the SOC. This activity will be integrated into the ongoing duties of the Management Section and the Management Team. The Wastewater Division Operations Manager and the I&I Group manager have been selected to perform the CMOM coordination.

Challenges:
- There are a large number of vacancies within the Division.

Opportunity:
- None identified at this time.

Performance Measure(s):
- Prepare Annual Report

Supporting Documents (In Appendix):
- FY 2010 through FY 2014 Annual Reports
5.0 CMOM Program Strategic Implementation Plan

5.1 Goals

Specific performance measures are established for each of the four (4) primary strategic planning areas:

- Regulatory compliance goals
  - Eliminate preventable sanitary sewer overflows
  - Comply with the VDEQ consent order requirements
- Customer service goals
  - Protect public health
  - Improve system reliability
  - Minimize service request response time
- Asset management goals
  - Design for operability and maintainability
  - Design, operate and maintain assets in a manner that results in the least lifetime cost of ownership while achieving all of the Division’s strategic goals
- Resource management goals
  - Manage labor costs
  - Manage energy costs

5.2 CMOM Program Improvement Opportunities

The Division’s program improvement opportunities were derived and individually presented in Section 4. Priorities for each of these opportunities for improvement have been established in accordance with the definitions in Section 5.3. The time frame for implementing each opportunity has been developed in accordance with the definitions established in Section 5.4. The Lead Organizational Unit has been assigned following management discussions. The opportunities and an initial schedule are presented in Section 5.6. In addition to this initial schedule, there are activities whose schedule is driven by the SOC.

5.3 Priority Definitions

A  Any business program or practice:
   - That is required to achieve regulatory compliance

B  Any business program or practice:
   - That has a significant opportunity for improvement between its current status and the recommended/desired performance level and that is required to achieve customer service, asset management and resource management goals.
C Any business program or practice:
  • That has a **significant opportunity** for improvement between its current status and the recommended/desired performance level and **may have a significant impact** on achieving customer service, asset management and resource management goals

D Any business program or practice:
  • That has a **moderate opportunity** for improvement between its current status and recommended/desired performance level and **may have a moderate impact** on achieving remaining goals

5.4 Time Frame Definitions

Note that consideration has to be given to budgeting cycles and procurement time lines when establishing the time frame for implementing an improvement opportunity. Also, note that the time frames used for this report are general in nature and will be refined significantly when the implementation is detailed and initiated.

  **Short Term**: The improvement will be accomplished within one (1) year.

  **Near Term**: The improvement will be accomplished within three (3) years.

  **Long Term**: The improvement will take more than three (3) years to accomplish.

5.5 Lead Organizational Unit Definitions

The lead organizational unit that organizational unit assigned to lead the Division’s effort to fulfill the opportunity for improvement.

<table>
<thead>
<tr>
<th>Management Team</th>
<th>MT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Section</td>
<td>MS</td>
</tr>
<tr>
<td>Pump Stations Section</td>
<td>PSS</td>
</tr>
<tr>
<td>Construction Section</td>
<td>CS</td>
</tr>
<tr>
<td>Infiltration/Inflow (I/I) Section</td>
<td>ISS</td>
</tr>
</tbody>
</table>
## 5.6 Opportunities and Initial Schedule

### Table 7 Opportunities

<table>
<thead>
<tr>
<th>CMOM Section ID</th>
<th>Opportunity</th>
<th>Priority</th>
<th>Time Frame</th>
<th>Lead Organizational Unit</th>
<th>Person Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 A</td>
<td>Develop and implement an employee retention plan</td>
<td>D</td>
<td>Long Term</td>
<td>MT</td>
<td>Director</td>
</tr>
<tr>
<td>04 C</td>
<td>Develop a tracking system for data entry and map updates</td>
<td>D</td>
<td>Short Term</td>
<td>MT</td>
<td>WW GIS Manager</td>
</tr>
<tr>
<td>04 D5</td>
<td>Purchase and implement the use hand held computing devices for the pump station maintenance staff</td>
<td>D</td>
<td>Near Term</td>
<td>PSS</td>
<td>Pump Station Manager</td>
</tr>
<tr>
<td>04 D6</td>
<td>Initiate a force main right of way and easement maintenance program</td>
<td>D</td>
<td>Short Term</td>
<td>MT</td>
<td>I&amp;I Manager</td>
</tr>
<tr>
<td>04 D6</td>
<td>Expand the valve maintenance program to include the remainder of the system.</td>
<td>A</td>
<td>Short Term</td>
<td>PSS</td>
<td>Pump Station Manager</td>
</tr>
<tr>
<td>05 A-B</td>
<td>Establish sufficient Infrastructure Inspector positions to maintain quality on concurrent construction projects</td>
<td>A</td>
<td>Short Term</td>
<td>MT</td>
<td>WW Ops Manager</td>
</tr>
<tr>
<td>06 A-C</td>
<td>Continue a program that monitors the effectiveness of and updates SOPs</td>
<td>A</td>
<td>Short Term</td>
<td>MT</td>
<td>WW Ops Manager</td>
</tr>
<tr>
<td>07 A-E</td>
<td>Maintain Membership in VA WARN network</td>
<td>D</td>
<td>Short Term</td>
<td>MT</td>
<td>WW Ops Manager</td>
</tr>
<tr>
<td>07 A-E</td>
<td>Review critical assets</td>
<td>D</td>
<td>Short Term</td>
<td>MT</td>
<td>Section Managers</td>
</tr>
<tr>
<td>07 A-E</td>
<td>Review and update contingency response plans for critical assets that are identified as high risk assets, that is, reasonable probability of or high level of consequences of failure.</td>
<td>C</td>
<td>Short Term</td>
<td>MT</td>
<td>Section Managers</td>
</tr>
</tbody>
</table>
### 5.7 Performance Measures

#### Table 8 Performance Measures

<table>
<thead>
<tr>
<th>CMOM Component Chapter</th>
<th>Performance Measures</th>
<th>Source of Information or Analysis</th>
<th>Fiscal Year Result</th>
<th>Planned Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>01 Goals to Meet General Standards</strong></td>
<td>Number of preventable operations and maintenance related SSOs reaching State waters</td>
<td>SSORS</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Number of preventable peak flow capacity related SSOs reaching State waters</td>
<td>SSORS</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Maintain Customer Satisfaction based on 311 call responses</td>
<td>311 Emails</td>
<td>99.90%</td>
<td>98% Complimentary Calls</td>
</tr>
<tr>
<td></td>
<td>Publicly available and up to date Annual Report</td>
<td>Posted on W/W Operations Website</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>02 A Organization - Administrative and Maintenance Positions</strong></td>
<td>Current staff level vs. authorized positions</td>
<td>Infinimium AS400</td>
<td>71% (70 of 90 positions filled)</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>Number of staff vacancies</td>
<td>Infinimium AS400</td>
<td>20</td>
<td>10%</td>
</tr>
<tr>
<td><strong>02 B Organization – Chain of Communication for Reporting SSOs</strong></td>
<td>Compliance rate for meeting SSO notification and reporting requirements</td>
<td>SSORS</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>03 A-E Legal Authority</strong></td>
<td>To be developed after legal authority is obtained</td>
<td>Requires Change in City Code</td>
<td>N/A</td>
<td>To Be Developed</td>
</tr>
<tr>
<td><strong>04 A Maintenance Facilities &amp; Equipment</strong></td>
<td>Availability rate of critical field equipment</td>
<td>Not being Tracked; need to add to Lucity</td>
<td>Not Available</td>
<td>To Be Developed</td>
</tr>
<tr>
<td><strong>04 B Collection System Map</strong></td>
<td>Time to Complete Map Updates</td>
<td>TBD with upcoming GIS update and SOPs with time frame</td>
<td>Not Available</td>
<td>To Be Developed</td>
</tr>
<tr>
<td></td>
<td>Number of Completed Map Updates</td>
<td>Not being Tracked; need to add to Lucity</td>
<td>78% (175/225)</td>
<td>100%</td>
</tr>
<tr>
<td><strong>04 C Management of Information</strong></td>
<td>Review/Update of Lucity CMMS</td>
<td>How many times a year they visit</td>
<td>1</td>
<td>1 per year</td>
</tr>
<tr>
<td>CMOM Component Chapter</td>
<td>Performance Measures</td>
<td>Source of Information or Analysis</td>
<td>Fiscal Year Result</td>
<td>Planned Goals</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------</td>
<td>----------------------------------</td>
<td>--------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>04 D1 Gravity Line Cleaning, Inspection and Testing</strong></td>
<td>Linear feet of pipe cleaned per month</td>
<td>Currently estimated by SA cleaned; need to add asset ID for cleaning to get Lucity Report</td>
<td>17,900</td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td>Linear feet of pipe televised per month</td>
<td>Currently estimated by SA cleaned; need to add asset ID for CCTV to get Lucity Report</td>
<td>14,200</td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td>Manholes checks performed per month</td>
<td>Currently estimated by SA MH Count; need to add asset ID for cleaning to get Lucity Report</td>
<td>New task to be implemented in FY 2016</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Number of gravity main blockages per month</td>
<td>Lucity</td>
<td>16.25</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Number of lateral stoppages on City per month</td>
<td>Lucity</td>
<td>111.25</td>
<td>165 or less</td>
</tr>
<tr>
<td></td>
<td>Number of lateral stoppages not on City per month</td>
<td>Lucity</td>
<td>158.75</td>
<td>200 or less</td>
</tr>
<tr>
<td><strong>04 D2 Root Management Program</strong></td>
<td>Linear Feet of Chemical Root Treatment per Year</td>
<td>Based on Dukes Root Control contract</td>
<td>31,000</td>
<td>25,000 or more</td>
</tr>
<tr>
<td></td>
<td>Linear Feet of Mechanical Root Cleaning per Year</td>
<td>Not being Tracked; add to Lucity Need to add asset ID to get a report from Lucity</td>
<td>New for FY 2016</td>
<td>5,000 or less</td>
</tr>
<tr>
<td></td>
<td>Number of root associated sanitary sewer overflows per month</td>
<td>SSORS</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>04 D3 Gravity Line Chemical and Biological Treatment</strong></td>
<td>Linear Feet of Jet Power Treatment per Year</td>
<td>Not being Tracked; add to Lucity Based on gallons used ??</td>
<td>New for FY 2016</td>
<td>10,000 or more</td>
</tr>
<tr>
<td></td>
<td>Number of FOG associated sanitary sewer overflows per month</td>
<td>SSORS</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>04 D4 Gravity Line Construction and Repair</strong></td>
<td>Number of gravity mains repaired or replaced per year</td>
<td>Lucity</td>
<td>106</td>
<td>100 or less</td>
</tr>
<tr>
<td></td>
<td>Number of manholes rehabilitated or replaced per year</td>
<td>Lucity</td>
<td>89</td>
<td>100 or less</td>
</tr>
<tr>
<td>CMOM Component Chapter</td>
<td>Performance Measures</td>
<td>Source of Information or Analysis</td>
<td>Fiscal Year Result</td>
<td>Planned Goals</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------</td>
<td>----------------------------------</td>
<td>--------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>CMOM Component Chapter</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>04 D5 Pump Station Maintenance and Operation</strong></td>
<td>Annual gravity system repair or replacement costs (Emergency Repairs + emergency contracts +ASC)</td>
<td>Lucity</td>
<td>$1,454,359</td>
<td>$1,500,000</td>
</tr>
<tr>
<td></td>
<td>Number of pump station Preventative Maintenance (PM) performed monthly</td>
<td>Lucity</td>
<td>38</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Pump station pump failures per Year</td>
<td>Lucity</td>
<td>221</td>
<td>Goal to be Less than prior year (284; FY 14)</td>
</tr>
<tr>
<td></td>
<td>Number of pump station related SSOs per Year</td>
<td>SSORS</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Annual pump station equipment repairs or replacement costs (Emergency Repairs + emergency contracts)</td>
<td>Not being Tracked; add to Lucity</td>
<td>$289,480</td>
<td>$307,727 (FY 14)</td>
</tr>
<tr>
<td><strong>04 D6 Force Main Maintenance</strong></td>
<td>Number of gate valves inspected and exercised per Year</td>
<td>Not being Tracked; add to Lucity Randle to determine number</td>
<td>New for FY 2016</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Percentage of ARVs inspected per Year</td>
<td>Not being Tracked; add to Lucity Randle to determine number</td>
<td>New for FY 2016</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Percentage of Aerial Crossings inspected per Year</td>
<td>Not being Tracked; add to Lucity Randle to determine number</td>
<td>New for FY 2016</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Annual forcemain repairs or replacement costs (Emergency Repairs + emergency contracts+ASC)</td>
<td>Not being Tracked; add to Lucity</td>
<td>$4,417</td>
<td>$0 (FY 14)</td>
</tr>
<tr>
<td><strong>04 D7 FOG Management Program</strong></td>
<td>Number of FSE Inspections per Year</td>
<td>Lucity</td>
<td>245</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>Number of FOG violations per Year</td>
<td>Lucity</td>
<td>58</td>
<td>AVG last few years = 58</td>
</tr>
<tr>
<td></td>
<td>Number of Civic Meeting FOG Education Programs per Year</td>
<td>1 per month</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>04 E Current System Capacity</strong></td>
<td>Temporary Flow Monitoring per year</td>
<td>Based on 4 meters with 75% uptime; add WO to Lucity of installs/removal</td>
<td>New for FY 2016</td>
<td>36 Meter Months or more</td>
</tr>
<tr>
<td></td>
<td>Hydraulic Model Updates to Reflect System Improvements</td>
<td>Woolpert</td>
<td>New for FY 2016</td>
<td>Update Every 2 Years</td>
</tr>
<tr>
<td>CMOM Component Chapter</td>
<td>Performance Measures</td>
<td>Source of Information or Analysis</td>
<td>Fiscal Year Result</td>
<td>Planned Goals</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------</td>
<td>-----------------------------------</td>
<td>--------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>04 F Identify and Prioritize Structural Deficiencies</td>
<td>Review of PACP CCTV inspections performed each year</td>
<td>Not being Tracked; add to Lucity</td>
<td>New for FY 2016</td>
<td>100%</td>
</tr>
<tr>
<td>04 G Appropriate Training</td>
<td>Safety training hours per employee</td>
<td>Classes but not hours being Tracked; add to Lucity</td>
<td>New for FY 2016</td>
<td>26 or more</td>
</tr>
<tr>
<td></td>
<td>O&amp;M training hours per employee</td>
<td>Classes but not hours being Tracked; add to Lucity</td>
<td>New for FY 2016</td>
<td>16 or more</td>
</tr>
<tr>
<td>05 A-B Design &amp; Performance Standards</td>
<td>Not Used</td>
<td>Not Used</td>
<td>Not Used</td>
<td>Not Used</td>
</tr>
<tr>
<td></td>
<td>Review and inspections of contractor construction projects</td>
<td>Lucity - Inspector</td>
<td>New for FY 2016</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Review and inspections of Division construction projects</td>
<td>Lucity - Construction Manager</td>
<td>New for FY 2016</td>
<td>100%</td>
</tr>
<tr>
<td>06 A-C Monitoring, Measurement and Program Modifications</td>
<td>Prepare an annual CMOM summary update</td>
<td>Include in Annual Report prepared in October</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Perform an annual CMOM Program Audit</td>
<td>Conduct every July after fiscal year end; complete by August</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CMOM performance measures reviewed annually</td>
<td>Conduct every July after fiscal year end; complete by August</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>07 A-E Sanitary Sewer Overflow Response Plan (SSORP)</td>
<td>SSORP reviewed and updated annually</td>
<td>Conduct every July after fiscal year end; complete by October</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Refresher training for Division personnel held semi-annually</td>
<td>Conduct every Oct and July</td>
<td>TBD</td>
<td>Yes</td>
</tr>
<tr>
<td>08 A-C System Evaluation and Capacity Assurance Plan</td>
<td>Complete Capacity Analysis of all proposed sewer connections</td>
<td>Based on number received from Engineering</td>
<td>5 of 5 Completed</td>
<td>100%</td>
</tr>
<tr>
<td>09 Consent Order Annual Report</td>
<td>Prepare Annual Report</td>
<td>Prepare by September 1 for MS4 Permit Data</td>
<td>FY15 Completed</td>
<td>Yes</td>
</tr>
</tbody>
</table>