Management, Operations, and Maintenance (MOM) Program

Revised July 2024

MANAGEMENT, OPERATIONS AND MAINTENANCE (MOM) PROGRAM

Prepared December 2008
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ACEC	American Council of Engineering Companies
ADA	American with Disabilities Act
AMP	Asset Management Plan
AWT	Advanced Water Treatment
BIM	Building Information Modeling
BMP	Best Management Practice
BTEX	Benzene, Toluene, Ethylbenzene, And Xylenes
BOD	Biochemical Oxygen Demand
BCP	Business Continuity Plan
CAD	Computer Aided Design
CAP	Condition Assessment Program
CAS	Compliance Auditing System
CBOD	Carbonaceous Biochemical Oxygen Demand
CC&B	Customer Care and Billing
CCTV	Closed Circuit Television
CD	Consent Decree
CE	Chesapeake Elizabeth
CEL	Central Environmental Laboratory
CHP	Combined Heat and Power
CHT	Collection, Holding and Transfer
CIP	Capital Improvement Program
CIS	Customer Information Systems
CMMS	Computerized Maintenance Management System
CP	Cathodic Protection
CROMERR	Cross-Media Electronic Reporting Rule
CROP	Contingency, Response and Operational Plan
DAS	Data Analysis Section
DBA	Database Administrator
DEM	Department of Emergency Management
DEQ	Virginia Department of Environmental Quality
DMRs	Discharge Monitoring Reports
DoD	Department of Defense
DPORs	Daily Plant Operating Reports
DQSAP	Data Quality Standards and Procedures
E&I	Electrical and Instrumentation Division
EBS	E-Business Suite
E2	Electronic Environmental Reporting System
EMNS	Emergency of Mass Notification Service
EAM	Enterprise Asset Management
EDMS	Environmental Data Management System
EDS	Enterprise Data Server
EEO	Equal Employment Opportunity
ENR	Enhanced Nutrient Removal
EPA	U.S. Environmental Protection Agency
ERP	Enterprise Resource Planning
FAL	Flow Acceptance Letter
FFTS	Federal Facility Technical Standards
FM	Force Main
FMLA	Family Medical Leave Act
FOG	Fats, Oil and Grease
FPR	Flow, Pressure and Rainfall
FSEs	Food Service Establishments
FTE	Full-Time Employee
GCDs	Grease Control Devices
GIS	Geographic Information System
GPS	Geographic Positioning System
H2S	Hydrogen Sulfide
HART	Hydraulic Analysis Review Team
HCS	Hydraulics and Capacity Section
HGL	Hydraulic Grade Line
HR	Human Resource
HR FOG	Hampton Roads Fats, Oils and Grease
HRPDC	Hampton Roads Planning District Commission
HRRP	Hurricane Readiness and Recovery Plan
HRSD	Hampton Roads Sanitation District
HRUBS	Hampton Roads Utility Billing Service
I/I	Infiltration and Inflow
IFM	Interceptor Force Main
ISPMM	Interceptor Systems Preventive Maintenance Manual
kW	kilowatts
l.f.	linear feet
LAMA	Leadership and Management Academy
LAMP	Leadership and Management Program
LEAP	Leadership Ethics and Accountability Program
LIMS	Laboratory Information Management System
LMS	Learning Management System
LOS	Level of Service
MACP	Manhole Assessment and Certification Program
MAP	Municiple Assitance Program
mg/L	milligrams per liter
MBR	Membrane Bio-Reactor
MGD	Million Gallons per Day
MOA	Memorandum of Agreement
MOM	Management, Operations and Maintenance Program
MPORs	Monthly Plant Operating Reports
NACE	National Association of Corrosion Engineers
NACWA	National Association of Clean Water Agencies
NASSCO	National Association of Sewer Service Companies
NEO	New Employee Training
NOV	Notice of Violation

NPDES	National Pollutant Discharge Elimination System
NTP	Nansemond Treatment Plant
OPC	Open Platform Control
OSHA	Occupational Safety & Health Administration
OTIS	Operations Treatment Information System
P3	Pretreatment & Pollution Prevention Division
PACP	Pipeline Assessment and Certification Program
PCBs	Polychlorinated Biphenyls
PCV	Pressure Control Valves
PIMS	Pretreatment Information Management System
PM	Preventative Maintenance
PMIS	Project Management Information System
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
PRS	Pressure Reducing Station
QST	Quality Steering Team
R&R	Refurbishment and Replacement
RCS	Regional Construction Standards
RHM	Regional Hydraulic Model
ROW	Rights of Way
RPM	Replacement Planning Model
RRF	Regional Residual Facility
RWWMP	Regional Wet Weather Management Plan
SCADA	Supervisory Control and Data Acquisition
SCAT	Sewage Collection And Treatment
SCD	Small Communities Division
SGT-HEM	Non-Saponifiable Oil And Grease
SOC	Special Order By Consent
SOP	Standard Operating Procedures
SRC	SWIFT Research Center
SSD	Sanitary Sewer Discharge
SSES	Sanitary Sewer Evaluation Survey
SSO RP	Sanitary Sewer Overflow Response Plan
SSO	Sanitary Sewer Overflow
SSORS	Sanitary Sewer Overflow Reporting System
STP	Sewage Treatment Plant
STWWOP	Short Term Wet Weather Operational Plan
SWIFT	Sustainable Water Initiative for Tomorrow
SWOT	Strength, Weakness, Opportunity and Threat
SWP3	Storm Water Pollution Prevention Plan
TAPS	Teamwork and Problem Solving
TBT	Tributyltin
TEC	Telog Enterprise Client
TIMS	Treatment Information Management System
TKN	Total Kjeldahl Nitrogen
TMDL	Total maximum daily load
TP	Total Phosphorus
TSD	Technical Services Division
TSS	Total Suspended Solids
UNIFIED	Understanding Necessary Initiatives for Inclusion, Equity, and Diversity
VDH	Virginia Department of Health
VDOL	Virginia Department of Labor
VDOT	Virginia Department of Transportation
VELAP	Virginia Environmental Lab Accreditation Program
VIP	Virginia Initiative Plant
VPDES	Virginia Pollution Discharge Elimination System
WAN	Wide Area Network
WARN	Water/Wastewater Agency Response Network
WEF	Water Environment Federation
WIFIA	Water Infrastructure Finance and Innovation Act
WWTP	Waste Water Treatment Plant
YPORs	Yearly Plant Operating Reports
YRIQ	Your Role in Quality

EXECUTIVE SUMMARY

HRSD, a political subdivision of the Commonwealth of Virginia, provides wastewater treatment services to 20 counties and localities in southeast Virginia. HRSD's service area is approximately 5,000 square miles and has a population of approximately 1.9 million. HRSD operates eight major treatment plants in Hampton Roads and six small facilities in the Small Communities service areas. These plants can treat up to 225 million gallons of wastewater each day collectively. HRSD also operates and maintains a sanitary sewer system of approximately 52 miles of gravity pipelines, 508 miles of force main pipelines and 90 pump stations in the systems served by the eight major treatment plant service areas covered by this MOM document. HRSD Small Communities Department (SCD) has four small treatment plant service areas, including pumping stations and collection system, are covered by a separate MOM document that reflects operating practices in those systems. HRSD acquired the collection system in Surry County, one plant in Lawnes Point in Smithfield, and two on the Eastern Shore which are also part of Small Communities service areas.

A Commission of eight members, appointed by the Governor for four-year terms, provides HRSD with direction and ensures public accountability. The General Manager/CEO leads the organization, supported by seven divisions (Communications, Engineering, Finance, Information Technology, Operations, Talent Management and Water Quality), the Commission Secretary and Deputy General Manager/CFO.

Since HRSD's inception, there has been one overriding promise —to treat wastewater and recover natural resources to project public health and the environment. HRSD has received national, state, and local recognition for environmental excellence, including numerous awards for plant performance and outstanding regulatory compliance.

The proper and efficient management, operation and maintenance of the facilities are essential to HRSD's ability to protect public health and the environment. Programs and practices are aligned to minimize Sanitary Sewer Overflows (SSOs) and to provide adequate system capacity. This document provides an overview of the many elements of HRSD's Management, Operations and Maintenance (MOM) program, and explains how the various departments and divisions work together to achieve their MOM goals.

HRSD has been working cooperatively with the counties and cities in the HRSD service area (Localities) to comply with the Clean Water Act. HRSD is pursuing compliance through a Consent Decree with the EPA and the Commonwealth and consulting with the Localities. An element of the Consent Decree is the formulation, implementation, and execution of an effective MOM Program. The Localities in the service area are responsible for implementing and executing their own MOM plans in accordance with the specific terms of their Administrative Order with the Commonwealth. HRSD has successfully implemented and executed its MOM Program. This document defines HRSD's MOM Program.

HRSD's Management, Operations and Maintenance Goals:

- Manage performance of the Regional Sanitary Sewer System
- Maintain regulatory compliance.

- Collect and analyze data (system performance, condition, etc.) to improve decision making.
- Balance and manage risk.
- Protect and preserve the environment and public health.
- Define levels of service targets
- Consistently meet/exceed customer expectations.

HRSD's Commission and staff are dedicated to the attainment of these goals. HRSD's history of environmental excellence and long record of accomplishments reflect the commitment to proper management, operations, and maintenance. HRSD's approach to achieving these goals is summarized in the pages that follow and documented in the numerous manuals and written procedures that guide the organization.

This MOM document contains six sections as follows:

- Executive Summary.
- HRSD MOM Program Framework.
- Operations and Maintenance Programs.
- Support Programs.
- Improvement Program Areas; and
- Audits and Performance Evaluation of MOM Program.

Consistent with EPA guidance, the MOM Program is an active and working document that presents HRSD's efforts with respect to system capacity, management, operations, and maintenance. It refers to provisions of current HRSD programs, procedures, and documents, all of which are subject to change in response to experience and other factors. The MOM Program provides the overall framework for HRSD's management of operations and maintenance. Operational circumstances may require adjustments to specifics of the MOM Program. EPA approved HRSD's MOM Program in 2011 under the terms of the Consent Decree. HRSD conducted a comprehensive update of the Program in 2015, 2018, 2021 and again in 2024 in order to keep it current with actual practices and programs. HRSD plans to update this MOM Program on a three-year cycle so the plan will remain relevant and reflective of current practices to the greatest extent possible.

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1. HRSD MOM PROGRAM FRAMEWORK

HRSD, a political subdivision of the Commonwealth of Virginia, provides wastewater treatment services to 20 counties and localities in southeast Virginia. HRSD's service area is approximately 5,000 square miles and has a population of approximately 1.9 million. HRSD operates eight major treatment plants in Hampton Roads and six small facilities in the Small Communities service areas. These plants can treat up to 225 million gallons of wastewater each day collectively. HRSD also operates and maintains a sanitary sewer system of approximately 52 miles of gravity pipelines, more than 500 miles of force main pipelines and 90 pump stations in the systems served by the eight major treatment plant service areas covered by this MOM document. HRSD Small Communities Department (SCD) has four small treatment plant service areas, including pumping stations and collection system, are covered by a separate MOM document that reflects operating practices in those systems. HRSD acquired the collection system in Surry County, one plant in Lawnes Point in Smithfield, and two on the Eastern Shore which are also part of Small Communities service areas.

The HRSD pump station count is subject to change as pumping facilities are decommissioned, new pumping facilities are brought online and/or interim pumping facilities are deployed as necessary to complement the system.

A Commission of eight members, appointed by the Governor for four-year terms, provides HRSD with direction and ensures public accountability. The General Manager/CEO leads the organization, supported by seven divisions (Communications, Engineering, Finance, Information Technology, Operations, Talent Management and Water Quality), the Commission Secretary and Chief Financial Officer.

The HRSD quality management approach, which encourages innovation and teamwork, has resulted in creative and productive thinking that has distinguished HRSD over the years. The divisions operate as cohesive teams, using assets and resources in the most effective manner possible. This facilitates the achievement of the MOM Program goals.

HRSD has been working cooperatively with the counties and cities in the HRSD service area (Localities) to comply with the Clean Water Act. HRSD is pursuing compliance through a Consent Decree with the EPA and the Commonwealth and consulting with the Localities. An element of the Consent Decree is the formulation, implementation, and execution of an effective MOM Program. The Localities in the service area are responsible for implementing and executing their own MOM plans in accordance with the specific terms of their Administrative Order with the Commonwealth. HRSD has successfully implemented and executed its MOM Program. This document defines HRSD's MOM Program.

HRSD's MOM Program covers the North Shore and South Shore operating areas. Some information is presented in this document regarding the Small Communities operating areas.

This overview chapter provides background information, explains the organizational structure, and describes HRSD's infrastructure.

1.1 Background

HRSD's history, mission, vision, awards, service area, unique regional approach and MOM goals are highlighted in this section.

1.1.1 History

In 1934, the Virginia General Assembly created the Hampton Roads Sanitation Disposal Commission with instructions to plan the elimination of pollution in Hampton Roads. Recommendations were made to the General Assembly, which resulted in the Sanitary Districts Law of 1938, along with "an Act to provide for and create the Hampton Roads Sanitation District." This Act required qualified voters within the District to decide, in a general election on November 8, 1938, if they favored creation of such a District. This referendum failed to gain a majority by about 500 votes out of nearly 20,000 votes cast and led to a revision of the Act. Another referendum was held on November 5, 1940, which resulted in a majority vote for the creation of the Hampton Roads Sanitation District. The District was named after Hampton Roads, a four-century-old ship anchorage located near the convergence of the James, Elizabeth, and Nansemond Rivers, before they flow into the Chesapeake Bay in southeastern Virginia.


POLLUTION IS POISON

AN EMPHATIC DENIAL

VOTE YES

The Enabling Act provides for HRSD to operate as a political subdivision of the Commonwealth of Virginia for the specific purpose of water pollution abatement in Hampton Roads by providing a system of interceptor mains and wastewater treatment plants to convey and treat sewage generated in the region by the surrounding Localities.

HRSD began operations on July 1, 1946, using facilities acquired from the United States government. The Warwick County Trunk Sewer, HRSD's first construction project, began on June 26, 1946, and was funded by HRSD's $6,500,000 Primary Pledge Sewer Revenue Bonds dated March 1, 1946. The Army Base Treatment Plant was HRSD's first treatment plant and began operation on October 14, 1947. The population of HRSD's service area has increased from nearly 288,000 in 1940 to approximately 1.9 million in 2024, and the treatment system has expanded over the years to meet the needs of a growing region.

1.1.2 HRSD's Promise, Vision and Priorities

1.1.2.1 HRSD Promise

We promise to treat wastewater and recover natural resources to protect public health and the environment.

1.1.2.2 HRSD Vision

Our communities will have clean waterways and reliable water resources for generations to come.

1.1.2.3 HRSD Priorities

HRSD has identified five priorities:

- Environmental Responsibility
- Financial Stewardship
- Talent
- Community Engagement, and
- Innovation

These priorities provide the structure for implementation of the strategic plan.

1.1.3 Awards

HRSD strives not only to meet, but to exceed environmental requirements at all levels. Award-winning performance and innovation continue to garner national honors. A list of awards is available at www.hrsd.com.

1.1.4 Service Area Descriptions

HRSD's service area includes 20 cities and counties of southeast Virginia, an area of approximately 5,000 square miles with a population of approximately 1.9 million according to the Weldon Cooper Center for Public Service (demographics.coopercenter.org published 1/7/2022). To ensure responsive assistance and the ability to meet future needs, HRSD works closely with the communities it serves.

Table 1-1. Service Area Description

Cities	Counties
Chesapeake	Accomack**
Hampton	Gloucester
Newport News	Isle of Wight
Norfolk	James City
Poquoson	King and Queen*
Portsmouth	King William*
Suffolk	Mathews*
Virginia Beach	Middlesex*
Williamsburg	Northampton**
	Surry**^
	York

*These communities are part of the Small Communities Department – Middle Peninsula that has a separate MOM Program that reflects operating practices in those systems.

**These communities are part of the Small Communities Department – Eastern Shore that has a separate MOM Program that reflects operating practices in those systems.

** ^ These communities are part of the Small Communities Department – Surry that has a separate MOM Program that reflects operating practices in those systems excluding the Town of Claremont.

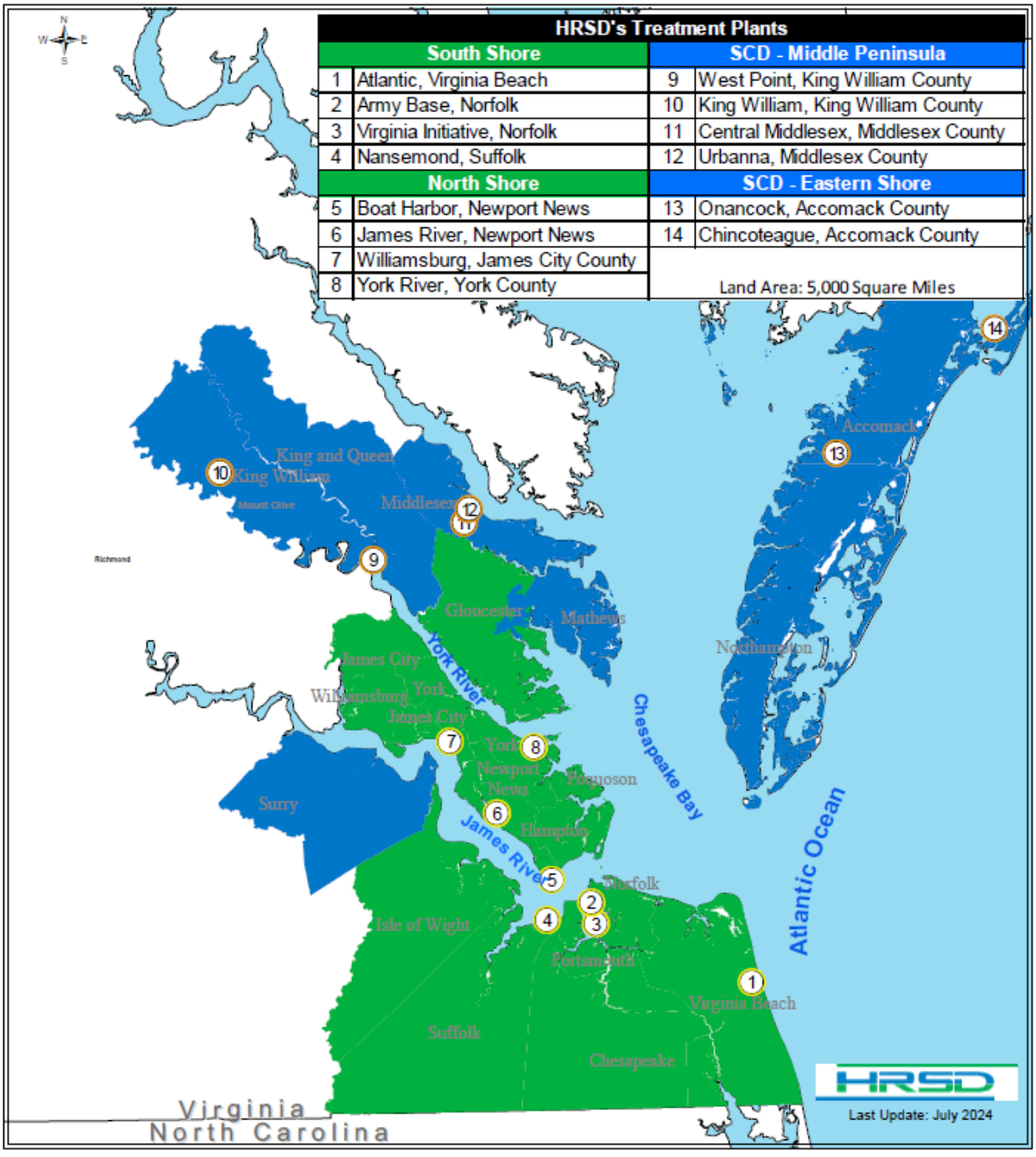

Figure 1-1. Map of HRSD Region

Note: Mt. Olive is a permitted facility but is not in operation and is not included in HRSD's treatment plant count.

1.1.4.1 Infrastructure Description

HRSD operates eight major treatment plants in the Hampton Roads metro area as part of this MOM Program. These plants are designed to treat up to 225 million gallons of wastewater each day. HRSD operates and maintains a system of approximately 52 miles of gravity pipelines, more than 500 miles of force main pipelines and 90 pump stations in the systems covered by this MOM document. The HRSD

pump station count is subject to change as pumping facilities are decommissioned, new pumping facilities are brought online and/or interim pumping facilities are deployed as necessary to assist the system. Facilities between the York River and the James River, as well as HRSD facilities in Gloucester County, are part of the North Shore system.

HRSD facilities in Matthews County are operated maintained by the Small Communities Department but transmit their flow to the North Shore system for ultimate transmission to the York River Treatment Plant. Facilities south of the James River are part of the South Shore system. This section provides an overview of the facilities managed, operated, and maintained by HRSD.

1.1.4.2 Wastewater Treatment Plants

HRSD operates eight, award-winning major treatment plants in Hampton Roads. Each of the eight major treatment plants and their related achievements for the last three years are profiled further in this section. HRSD is recognized as a leader in the industry, with an impressive record of environmental permit compliance. HRSD must comply with Virginia Pollutant Discharge Elimination System (VPDES) permit limitations. The Virginia Department of Environmental Quality (DEQ) issues the permits, which are reviewed, revised (if necessary) and reissued on a five-year schedule.

All HRSD's treatment plants provide at least secondary level of treatment, and the majority of these facilities currently provide biological or chemical nutrient removal. In 2006, the DEQ initiated new regulations that included a mass limit by river basin for both nitrogen and phosphorus. These regulations were followed by additional reduction requirements mandated by the Chesapeake Bay Total Maximum Daily Load (TMDL). The initial limits became effective in 2011 with phased implementation of additional reductions. Upgrades to meet the first of the phased nutrient reductions are complete. These included the upgrades of three plants on the James River and one on the York River to meet the 2011 limits followed by major upgrades at two additional plants on the James River to meet the 2017 limits. No further reductions were required for HRSD's York River 2021 aggregate mass limit. Additional reductions for HRSD's James River aggregate mass limits to meet the 2021 limits are being achieved by the closure of the Chesapeake Elizabeth plant. HRSD currently plans to meet the anticipated 2026 reduction requirements through the consolidation of one of its facilities and other treatment plant upgrades.

HRSD handles biological solids generated at its treatment plants either through incineration, land application or contract composting. HRSD is also permitted to dispose of solids at a permitted landfill; however, this option is normally only used for non-biological residuals. When operationally and economically feasible, HRSD reuses biosolids, a nutrient-rich organic matter that is a by-product of the treatment processes. There are many beneficial uses for biosolids, which must meet stringent federal and state standards for safety.

Biosolids collected locally are applied to land as fertilizer or composted under a separate contract. Through HRSD's Pollution Prevention & Pretreatment (P3) Program, businesses and industries reduce toxins and other pollutants entering HRSD's system. HRSD also has one facility that recovers phosphorus indirectly from the influent wastewater by converting this phosphorus to a slow-release fertilizer.

ARMY BASE TREATMENT PLANT

401 Lagoon Road
Norfolk, Virginia 23505

As of May 31, 2024

A major plant improvement project was completed in 2018 for advanced biological nutrient removal.

Table 1-2. Army Base Treatment Plant	
Receiving Stream	Elizabeth River
Operation Startup	1947 (11-MGD primary)
Permitted Design Flow	18 MGD
Peak Hydraulic Capacity	36 MGD
Average Daily Flow (2023)	9.45 MGD
Level of Treatment	Secondary with biological nutrient removal (BNR)
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) Phosphorus: 1.0 mg/L (annual average) Total Nitrogen: 5.0 mg/L (annual average)
Permit Compliance Awards	Peak Performance Awards are presented annually by the NACWA to recognize exceptional permit compliance. Platinum (5 consecutive years of no permit violations) – N/A Gold (no permit violations for the year) – 2023,2022 Silver (fewer than six violations) – 2021

ATLANTIC TREATMENT PLANT

645 Firefall Drive
Virginia Beach, Virginia 23454

As of May 31, 2024

Table 1-3. Atlantic Treatment Plant	
Receiving Stream	Atlantic Ocean
Operation Startup	1983 (36-MGD secondary)
Permitted Design Flow	54 MGD
Peak Hydraulic Capacity	135 MGD
Average Daily Flow (2023)	43.55 MGD
Level of Treatment	Secondary
Solids Management	Land application
Disinfection Method	Liquid sodium hypochlorite
Disinfection Process	Chlorination
Effluent Discharge Limitations: *(reported monthly to the DEQ)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Chlorination: 2.5 mg/L (monthly average); 4.0 mg/L (weekly maximum)
Permit Compliance Awards	Peak Performance Awards are presented annually by NACWA to recognize exceptiona permit compliance. Platinum (5 consecutive years of no permit violations) – 2023, 2022, 2021 Gold (no permit violations for the year) – N/A Silver (fewer than six violations) – N/A

BOAT HARBOR TREATMENT PLANT

300 Terminal Avenue Newport News, Virginia 23607

As of May 31, 2024

HRSD is executing steps to build a pump station and transmission force main to be completed in 2026 that will move flow from this facility to Nansemond and facilitate the closure of Boat Harbor.

Table 1-4. Boat Harbor Treatment Plant	
Receiving Stream	James River (lower)
Operation Startup	1948 (12-MGD primary)
Permitted Design Flow	25 MGD
Peak Hydraulic Capacity	55 MGD
Average Daily Flow (2023)	11.13 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Dechlorination: 0.2 mg/L (monthly average); 1.3 mg/L (weekly maximum) Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	Peak Performance Awards are presented annually by NACWA to recognize exceptional permit compliance. Platinum (5 consecutive years of no permit violations) – 2023, 2022, 2021 Gold (no permit violations for the year) – N/A Silver (fewer than six violations) – N/A

JAMES RIVER TREATMENT PLANT

111 City Farm Road
Newport News, Virginia 23602

As of May 31, 2024

Construction of the first full-scale Sustainable Water Initiative for Tomorrow (SWIFT) Program is underway to produce a highly treated SWIFT Water® that meets drinking water standards and is suitable for recharge of the Potomac Aquifer by 2027.

Table 1-5. James River Treatment Plant

Receiving Stream	Warwick River
Operation Startup	1967 (5-MGD secondary)
Permitted Design Flow	20 MGD
Peak Hydraulic Capacity	50 MGD
Average Daily Flow (2023)	11.63 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Compost
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Dechlorination: 0.2 mg/L (monthly average); 0.6 mg/L (weekly maximum) Phosphorus: 2.0 mg/L (annual average) Nitrogen: 12 mg/L (annual average)
Permit Compliance Awards	Peak Performance Awards are presented annually by NACWA to recognize exceptional permit compliance. Platinum (5 consecutive years of no permit violations) – 2023, 2022, 2021 Gold (no permit violations for the year) – N/A Silver (fewer than six violations) – N/A

NANSEMOND TREATMENT PLANT

6909 Armistead Road
Suffolk, Virginia 23435

As of May 31, 2024

HRSD is executing steps to build a pump station and transmission force main to be completed in 2026 that will move flow from Boat Harbor to Nansemond and facilitate the closure of Boat Harbor. Construction of the second full-scale Sustainable Water Initiative for Tomorrow (SWIFT) Program is underway to produce a highly treated SWIFT Water® that meets drinking water standards and is suitable for recharge of the Potomac Aquifer by 2027.

Table 1-6. Nansemond Treatment Plant

Receiving Stream	Hampton Roads/James
Operation Startup	1983 (10-MGD secondary)
Permitted Design Flow	30 MGD
Peak Hydraulic Capacity	75 MGD
Average Daily Flow (2023)	15.83 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Incineration at another plant site & contract composting
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Dechlorination: 0.2 mg/L(monthly average); 2.4 mg/L (weekly maximum) Phosphorus: 2.0 mg/L (annual average) Nitrogen: 8.0 mg/L (annual average)
Permit Compliance Awards	Peak Performance Awards are presented annually by NACWA to recognize exceptional permit compliance. Platinum (5 consecutive years of no permit violations) – 2023, 2022, 2021 Gold (no permit violations for the year) – N/A Silver (fewer than six violations) – N/A

VIRGINIA INITIATIVE TREATMENT PLANT (VIP)

4201 Powhatan Avenue
Norfolk, Virginia 23508

As of May 31, 2024

Table 1-7. Virginia Initiative Treatment Plant (VIP)	
Receiving Stream	Elizabeth River
Operation Startup	1948 (20-MGD primary, formerly the Lamberts Point Plant)
Permitted Design Flow	40 MGD
Peak Hydraulic Capacity	100 MGD
Average Daily Flow (2023)	28.37 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) Phosphorus: 1.0 mg/L (annual average) Nitrogen: 5.0 mg/L (annual average)
Permit Compliance Awards	Peak Performance Awards are presented annually by NACWA to recognize exceptional permit compliance. Platinum (5 consecutive years of no permit violations) – 2023, 2022, 2021 Gold (no permit violations for the year) – N/A Silver (fewer than six violations) – N/A

WILLIAMSBURG TREATMENT PLANT

300 Ron Springs Road Williamsburg, Virginia 23185

As of May 31, 2024

Table 1-8. Williamsburg Treatment Plant	
Receiving Stream	James River (lower)
Operation Startup	1971 (9.6-MGD secondary)
Permitted Design Flow	22.5 MGD
Peak Hydraulic Capacity	45 MGD
Average Daily Flow (2023)	8.02 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) Phosphorus: 2.0 mg/L (annual average) Nitrogen: 14 mg/L (annual average)
Permit Compliance Awards	Peak Performance Awards are presented annually by NACWA to recognize exceptional permit compliance. Platinum (5 consecutive years of no permit violations) – 2023, 2022, 2021 Gold (no permit violations for the year) – N/A Silver (fewer than six violations) – N/A

YORK RIVER TREATMENT PLANT

515 Back Creek Road Seaford, Virginia 23696

As of May 31, 2024

Table 1-9. York River Treatment Plant	
Receiving Stream	York River
Operation Startup	1983 (15-MGD secondary)
Permitted Design Flow	15 MGD
Peak Hydraulic Capacity	37.5 MGD
Average Daily Flow (2023)	11.69 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Compost
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) Fecal coliform: 200/100 mL (geometric mean) Enterococcus: 35/100 mL (geometric mean) Dechlorination: 0.2 mg/L (monthly average); 1.3 mg/L (weekly maximum) Phosphorus: 0.7 mg/L (annual average) Nitrogen: 8.0 mg/L (annual average)
Permit Compliance Awards	Peak Performance Awards are presented annually by NACWA to recognize exceptional permit compliance. Platinum (5 consecutive years of no permit violations) – 2023, 2022, 2021 Gold (no permit violations for the year) – N/A Silver (fewer than six violations) – N/A

1.1.4.3 Interceptor System

HRSD's Interceptor System for North Shore and South Shore Operations conveys wastewater from the Localities to one of the nine HRSD wastewater treatment plants. Wastewater generated by residences and businesses usually flows through gravity pipelines owned by a Locality. From there, the wastewater flows to a Locality-owned pump station where the wastewater is pumped into a large interceptor pipeline owned by HRSD. In a few areas, wastewater flows by gravity from the Locality system to an HRSD gravity pipe. Once in the HRSD collection system, the wastewater is typically pumped to a treatment plant where the wastewater is treated and discharged. The schematic below illustrates the wastewater flow path described above.

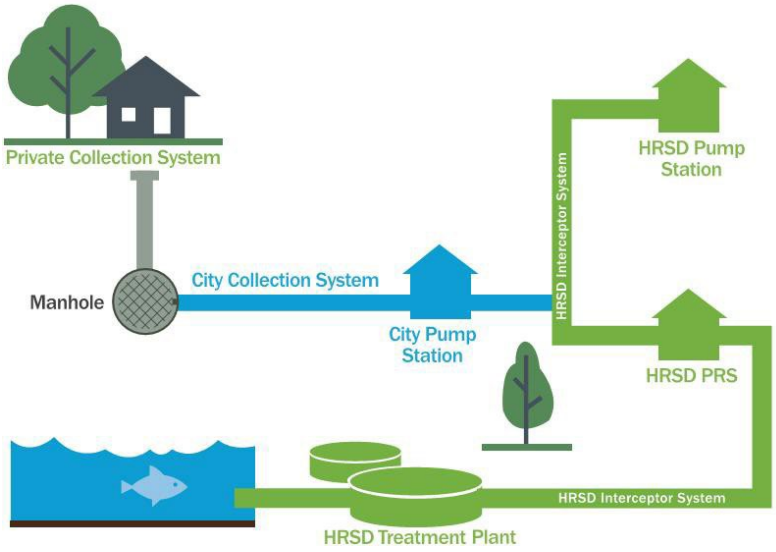

Figure 1-2. HRSD Wastewater Flow Path

The Hampton Roads topography is relatively flat, resulting in the need for a pressurized sewer system. HRSD's interceptor system consists primarily of force mains, which are pressurized with pumped wastewater that is delivered to the treatment plants. HRSD owns some large gravity mains in a few older areas of Hampton Roads which convey flow to large lift pump stations. Overall, approximately 90 percent of HRSD's interceptor system in Hampton Roads is comprised of force mains. The remaining 10 percent consists of the large gravity mains. HRSD also owns and operates a storage tank facility at Coliseum PRS and Providence PRS.

Additional tanks are planned to provide diurnal flow equalization and wet weather storage. Detailed statistics and maps of the interceptor system are provided on Figures 1-3 and 1-4 below.
Currently, the interconnectivity of HRSD pipelines allows for certain, limited diversion of flows among treatment plants located within the same HRSD shore.

This diversion capability allows for limited flexibility so flows can be diverted in different directions to enable the plants to utilize capacity to the fullest potential. If a line break occurs in the system, HRSD is sometimes able to isolate the break by closing valves on either side of the break and redirecting the flow to another treatment plant, thus minimizing the potential for large volume overflows from the system. HRSD is executing steps to build a pump station and transmission force main by June 2026 that will move flow from this facility to Nansemond and facilitate the closure of Boat Harbor.

The HRSD system also utilizes a unique feature for a collection system—pressure reducing stations (PRSs). These PRSs are in-line pump stations that enable pressure reduction in force mains upstream of the PRS. HRSD PRSs are designed to provide pumping assistance to large portions of the pressurized system. PRS

operational setpoints are based on thorough evaluations of upstream lift station pumping capabilities and projected system demands.

A Supervisory Control and Data Acquisition (SCADA) system allows HRSD to monitor many different parameters within the interceptor system. SCADA alarms utilized by HRSD include, but are not limited to, pump station overflows, high wet well levels, out of service alarms, back-up/auxiliary power alarms, and equipment failure alarms. Crews are notified of SCADA alarms and respond appropriately to the type of alarm registered.

HRSD has many flow and pressure meters within its system and has implemented a Flow, Pressure and Rainfall (FPR) Monitoring system. This FPR system includes many flow, pressure and rainfall meters and gauges that enable HRSD to maintain and manage system performance and reliability as well as to calibrate and verify system hydraulic modeling.

Table 1-11 shows a summary of the active assets that HRSD currently operates in its North Shore and South Shore systems as of July 1, 2023.

Table 1-10. HRSD North Shore and South Shore Interceptor System Overview

	North Shore System	South Shore System	Total System
Number of Pump Stations	33	37	69
Number of Pressure Reducing Stations	3	18	21
Number of Air Vents	1,1028	1,773	2,801
Number of Valves	1,582	2,252	3,834
Total Length of Force Main (ft.)	1,009,577	1,677,861	2,687,438
Total Length of Gravity Main (ft.)	152,791	123,445	276,236
Number of Gravity Manholes	696	575	1,271

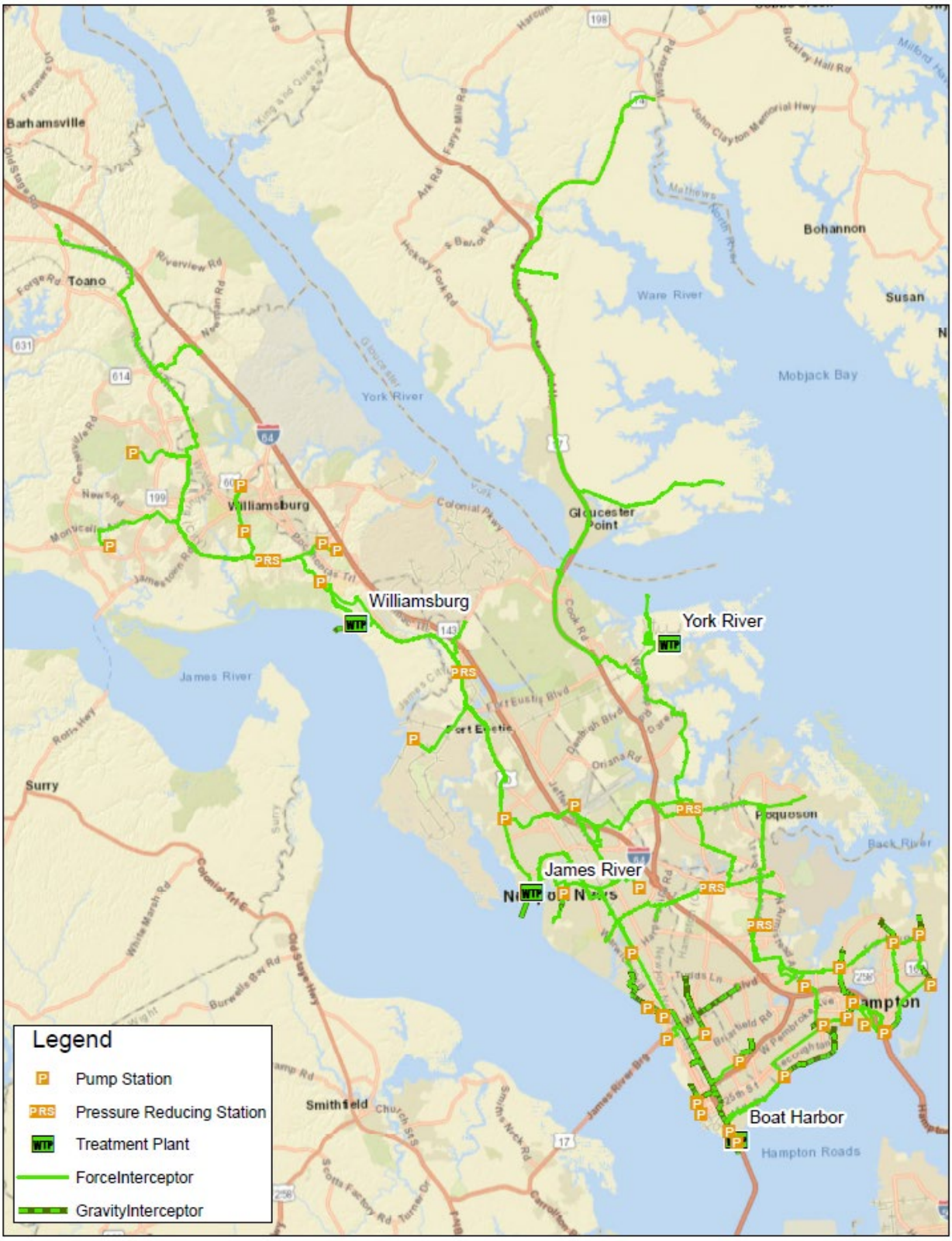

Figure 1-3. HRSD North Shore Interceptor System

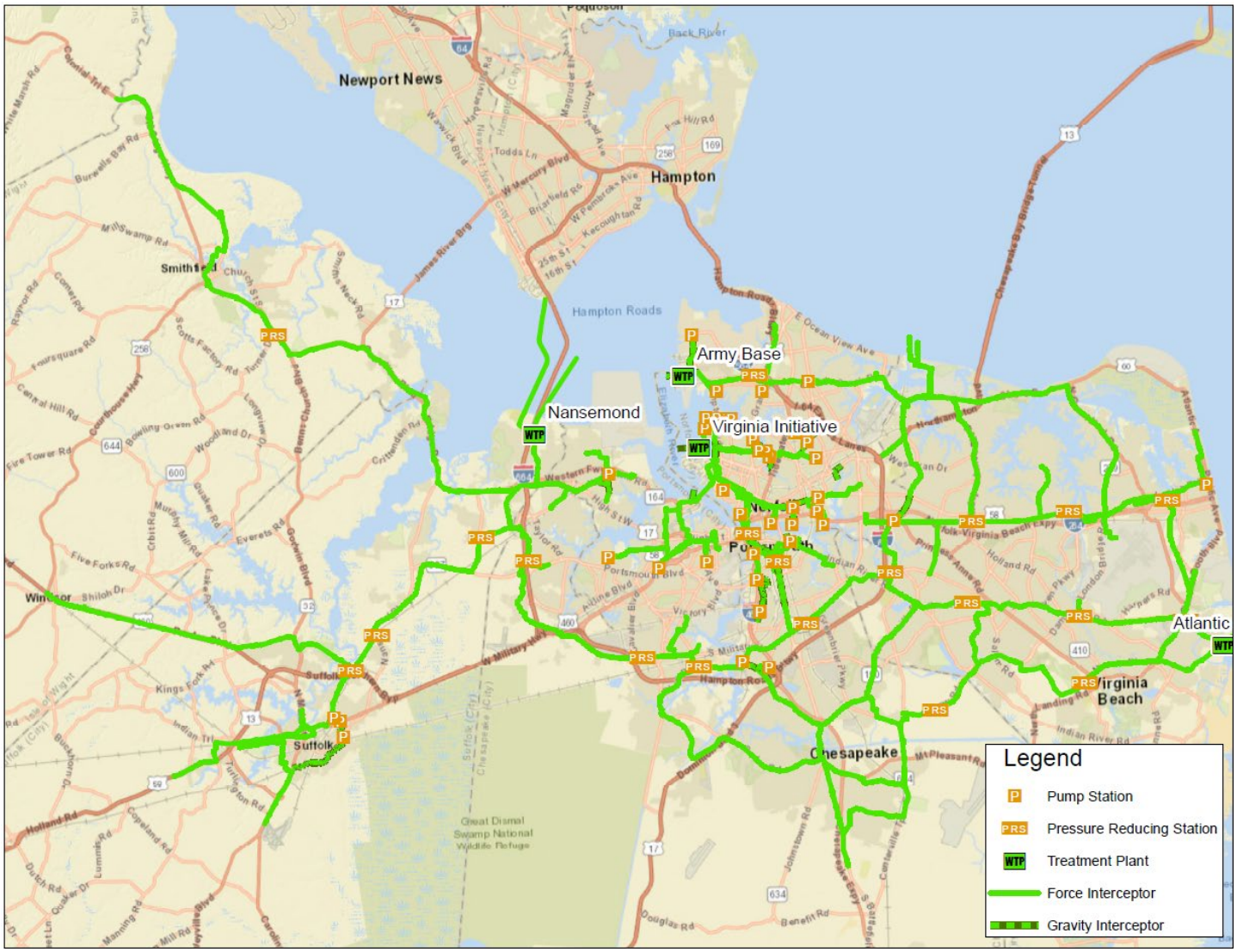

Figure 1-4. HRSD South Shore Interceptor System

1.1.5 A Unique Regional Approach

The state legislation that created HRSD in 1940 established a regional approach to wastewater treatment unlike any other in the United States. The General Assembly endowed HRSD, which is a political subdivision of the Commonwealth of Virginia, with the responsibility to "provide for the public health and welfare." HRSD's enabling legislation provided for various authorities necessary to conduct business. These powers and authorities are highlighted in Section 3.17 – Legal Authority.

There are no formal contracts between HRSD, and the Localities served in the metro area for conveyance and treatment of wastewater. A city or county that wishes to become a part of HRSD must petition the Circuit Court to become a member of HRSD. The legislature ultimately amends the Enabling Act to include the new locality.

The unique regional structure requires collaboration with multiple entities to ensure proper management, operations and maintenance of the regional system are achieved. HRSD works closely with each locality that contributes flow to the regional system. Regular meetings are held with many of the Localities to discuss planning and operational issues. HRSD representatives attend meetings of the region's utility directors and the Capacity Team (composed of technical representatives from some Localities and HRSD) and participate in a variety of regional initiatives. These include the Hampton Roads Chamber, the Virginia Peninsula Chamber and a host of committees organized by the Hampton Roads Planning District Commission (HRPDC).

The regional approach includes HRSD's oversight of industries and small businesses that discharge wastewater to HRSD. HRSD's Pretreatment and Pollution Prevention Division (P3) is empowered to regulate these businesses and industries, including the authority to assess Civil Penalties, if necessary. HRSD levies surcharges for certain types of high-strength waste that comes into its system and invoices these businesses accordingly. All businesses must comply with HRSD's pretreatment requirements and are subject to periodic inspections.

A new development that is proposed to connect to the HRSD system goes through a flow acceptance process. The Localities and HRSD, in consultation with DEQ, review the proposed connections before allowing new or additional flow to be added to the system. The Industrial Wastewater Discharge Regulations provide guidance on what materials are acceptable and what may be prohibited for discharge into the system.

Through HRSD's Industrial Wastewater Discharge Regulations and interceptor policies, HRSD has the authority to enforce actions on entities that contribute excessive grit and grease; infiltration and inflow (I/I); storm water connections; and water from other sources such as sump pumps, air conditioning condensate and landfills. Additionally, HRSD has staff and procedures in place to assure that others do not encroach on property owned by HRSD or negatively impact pipelines located in easements.

In 2014, HRSD and the Localities agreed on a regional approach to capacity assessment and improvements for the Regional Wet Weather Management Plan (RWWMP). The regional approach is a cooperative effort between HRSD and the Localities to identify and implement reasonably cost-effective RWWMP capacity improvements, regardless of asset ownership. The regional approach is considered a "hybrid approach" in that it reflects a shared responsibility by HRSD and the Localities to address regional sewer capacity needs, instead of delineating responsibility strictly along ownership lines or to one lead entity. More detail on the regional approach and the responsibilities of HRSD and the Localities is described in Section 3.8.3.12.

1.1.6 MOM Goals

The goals of the MOM Program include:

- Manage performance of the Regional Sanitary Sewer System.
- Maintain regulatory compliance Collect and analyze data (system performance, condition, etc.) to improve decision making.

- Balance and manage risk.
- Protect and preserve the environment and public health.
- Define levels of service targets.
- Consistently meet/exceed customer expectations.

1.1.7 Consent Orders/Consent Decree

On February 23, 2010, HRSD entered a Federal Consent Decree with the EPA and the Department of Justice. The compliance requirements outlined in the decree included the following:

- Flow, Pressure and Rainfall Monitoring.
- Regional Hydraulic Model and Hydraulic Assessment.
- Condition Assessment.
- Interim System Improvements.
- Management, Operations and Maintenance Program.
- Regional Wet Weather Management Plan.
- SSO Emergency Response Plan.
- Coordination with Localities.
- Public Participation.
- Reporting Requirements.

The requirements of the Federal Consent Decree are similar in nature to the requirements of the former State Special Order by Consent (SOC). The Consent Decree has been modified six times since its inception. The third modification included provisions for HRSD to make capacity improvements throughout Hampton Roads as part of a "Regionalized" Wet Weather Management Plan. Improvements to HRSD and Locality assets will reduce the overall economic impact to the shared rate payers.

Amendment No. 4 brought SWIFT into the Decree along with the RWWMP Approach. EPA acknowledged the importance and benefits of SWIFT relative to Wet Weather Improvements and allowed HRSD to factor SWIFT into the prioritization of improvements as part of the Integrated Plan, which was approved in February 2022.

Amendment No. 5 approved the RWWMP and required "...quarterly SSO reports to VADEQ and EPA, in which HRSD will identify all SSOs, SSDs, Prohibited Bypasses, or unauthorized discharges from the HRSD SS System or the HRSD STPs.

Amendment No. 6 includes non-material modifications related to scopes and schedules for Rehab Action Plan Phase 2 Projects, modifications to the schedules for High Priority Projects, adjustment to the force main inspection proximity requirements, and procedural changes for discarding information following the required retention period. These modifications were presented at three public meetings in 2023.

Additionally, HRSD was formerly party to a regional SOC issued by the Virginia Department of Environmental Quality (DEQ). This SOC was a multi-party enforcement action that involved HRSD, DEQ, and a number of Localities: the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach and Williamsburg, the counties of Gloucester, Isle of Wight and York; the town of Smithfield; and the James City Service Authority. However, as a result of the decision to pursue regionalization of capacity, the SOC was terminated by DEQ. The new SOC contains only MOM-related requirements for the Localities.

The P3 Department of HRSD's Water Quality Division oversees HRSD coordination with industrial and federal facilities in the Hampton Roads area that discharge wastewater to HRSD treatment facilities. HRSD has identified through modeling and field investigative work that federal facility sewer systems connected to

the HRSD regional system contribute infiltration and inflows during wet weather. The degree to which the individual facilities contribute wet weather flow varies. Because these federal facilities are considered industrial, P3 regulates what is discharged. HRSD, through their enabling legislation, has broad authority to pursue the remediation of these contributory sources of wet weather flow. HRSD has placed federal facilities under Infiltration/Inflow (I/I) Orders to achieve peak flow reductions.

At present, HRSD is systematically working with the federal facilities to first complete sewer system investigative and Sanitary Sewer Evaluation Survey (SSES) work and then to reduce peak wet weather flows from the federal facility sewer systems. Federal Facility Technical Standards have been developed that provide detailed requirements for improvements. These standards are available in the P3 office or the HRSD main website, www.hrsd.com. HRSD has prioritized the federal facilities systems and is working with each in the order of priority to reduce wet weather flows from these sources.

1.2 Organization

HRSD's structure facilitates the commitment to proper management, operations, and maintenance. This section explains HRSD's organization, the role of each component and how Commissioners and staff at all levels of the organization work together to attain the MOM goals.

1.2.1 Governance

HRSD's governance is prescribed by its enabling legislation (§45 of Chapter 66 of the Act of Assembly of 1960 as amended by Chapter 520 of the Acts of Assembly of 1964), which was passed by the Virginia General Assembly. The HRSD Commission, an eight-member board appointed by the Governor of Virginia, provides direction, and ensures public accountability. The Commission meets monthly to set policy, approve expenditures and decide budget matters. The Commission is also responsible for selecting the general manager and supervising the performance of this individual. Commissioners, who must reside in the various Localities in HRSD's service area, are appointed for four-year terms and may be reappointed. The Commission elects a chair and a vice-chair annually.

1.2.2 Continual Improvement Management Framework

HRSD's management philosophy is based upon quality improvement principles and the recognition that a motivated, knowledgeable, and skilled workforce is vital to success. HRSD implemented a Quality Program in the early 1990s, focused on training a cadre of facilitators capable of conducting training as well as facilitating quality improvement processes. Leaders and potential future leaders are trained in quality principles through the Leadership Program. In addition, all new supervisors attend an equivalent of 48 hours of a supervisory training program which provides additional tools and a job shadowing experience to help new supervisors be effective in their new roles.

The executive management team at HRSD is referred to as the Quality Steering Team (QST). The QST is comprised of the division chiefs, some department leaders, an Employee Association representative, a Understanding Necessary Initiatives For Inclusion, Equity, & Diversity (UNIFIED) Council representative and the General Manager/CEO. The QST establishes objectives, sets policy, and provides broad guidance to the organization. Through this team approach, the QST focuses on cross-divisional issues, ensuring HRSD resources are deployed in the most cost-effective manner. In addition, division-level QSTs guide improvements within specific divisions.

The QST also guides HRSD's Quality Improvement Program. Three facilitator groups (Workplace; Teamwork and Problem Solving; and Leadership) comprised of trained facilitators from each division work together as ad hoc teams to further the advancement of quality.

Quality facilitators from each division act as internal consultants to assist the organization in implementing and maintaining the strategic planning process with a focus on the annual business plan. The facilitators are trainers and change agents. They assist the QST in developing and deploying the annual planning process to all parts of the organization.

1.1.7.1 Strategic Planning Process

HRSD uses strategic planning principles to guide the direction of business over the long term. A strategic planning steering committee has been appointed by the QST to update and monitor the strategic plan. The planning process provide an opportunity for input from stakeholders. Strategic planning data is analyzed by the QST on a monthly basis to identify areas critical to HRSD's success in the future. Broad strategic objectives are established which serve as the basis for organizational action and guides for development of the business plan. The results of this analysis are drafted and presented to the Commission for concurrence and adoption.

1.1.7.2 Capital Improvement Program

The Capital Improvement Program (CIP) establishes a prioritized annual capital budget with details for planned projects over a 10-year time frame. Projects in the CIP are typically large construction projects greater than $200,000 resulting in the addition, rehabilitation, or replacement of assets of a relatively permanent nature such as property, structures, pipes, plants, and equipment. Projects can originate from many sources including the Strategic Plan, the asset management program, and the needs defined by the Operations Division or in response to an emergency situation or unique opportunity.

The CIP is not an approval or appropriation of funds for individual projects. There is no authorization or funding for individual projects until the Commission acts on the specific project. The Commission formally authorizes individual projects through their approval and appropriation of funds and by the approval of professional services agreements, construction contracts or other project-related activities.

1.2.3 Organizational Charts

Organizational charts are updated periodically when changes are made to staff. The most current staffing structures appear in Appendix A.

1.2.4 Staffing

HRSD has 947 approved positions in the FY 2025 budget. The individuals who fill them perform a variety of duties essential to the organization's mission. The Talent Management Division maintains current job descriptions for all positions. The job descriptions define the nature of the work to be performed, provide common examples of the type of work, and outline minimum requirements for the position, necessary qualifications or certifications and licenses that may be required.

HRSD monitors employee turnover rate as a strategic measure to ensure that we have the staffing necessary to be successful.

1.2.5 Division Descriptions

Under the **General Manager** there are seven major divisions: Operations, Engineering, Water Quality, Finance, Information Technology, Talent Management, and Communications. These divisions operate as cohesive teams, using assets and resources in the most effective manner possible. This facilitates attainment of the MOM goals. Under each division is a series of departments aligned to functional responsibilities or physical facilities.

The **Operations Division** is responsible for operating and maintaining all HRSD's treatment plants, pumps stations, pipelines, buildings and equipment. The Chief Technology Officer, who oversees the development of new technology with a focus on rapid deployment of innovative solutions, is part of the Operations Division. The divisions under the Operations Division are Water Technology and Research, two Electrical and Instrumentation Departments (E&I), Support Systems, three Treatment Departments, the Small Communities Departments for the Middle Peninsula, Surry, and the Eastern Shore and two Interceptor Systems Departments on the North and South Shores. Section 1.2.9 provides a detailed description of the Operations Division.

The **Engineering Division** is responsible for HRSD facility planning, design and construction, and related support. There are five departments under the Engineering Division: Design and Construction (North Shore, South Shore, Special Projects, and SWIFT), Planning and Analysis, and Asset Management. Section 1.2.8 provides a detailed description of the Engineering Division.

The **Water Quality Division's** mission is to provide quality environmental services to support HRSD and its partners. This Division helps ensure compliance with HRSD environmental permits and leads regulatory advocacy efforts through the work of three departments: the Central Environmental Laboratory Department,

the P3 Department, and the Technical Services Department (TSD). Section 1.2.10 provides a detailed description of the Water Quality Division.

The **Finance Division** is responsible for HRSD's general financial and business functions, including financial reporting, investment portfolio, debt and risk management, and customer billing. The Finance Division includes the Accounting Department, Business Intelligence, Compliance & Risk, Customer Care Center, and Procurement Department. Section 1.2.7 provides a detailed description of this Division.

The **Information Technology Division** is responsible for HRSD's computer systems, communication systems, network systems, cybersecurity, and data management functions. The Information Technology Division consists of the Enterprise Data Services Department, Information Technology Operations Department, and the Cybersecurity Department. Section 1.2.11 provides a detailed description of this Division.

The **Talent Management Division** attracts new talent, develops talent, and retains existing talent. The division maintains employee records, handles employee recruiting and orientation, administers employee benefits, oversees the apprenticeship program and training, and ensures employee safety. The Talent Management Division includes the Human Resources Department, Learning and Development (L&D), and Safety Departments. Section 1.2.12 provides a detailed description of this Division.

More detailed information on each Division can be found in the following Sections 1.2.6 through 1.2.12.

1.2.6 General Management

The general manager supervises the Division chiefs, Chief Communications Officer, Chief Financial Officer, Director of Digital Water, and the Commission Secretary. The Communications Division supports HRSD's mission through communications, community outreach and education programs. The Commission Secretary provides administrative support to the General Manager as well as the HRSD Commission.

1.2.6.1 Communications Division

The Communications Division supports HRSD's mission through public outreach, community engagement and educational programs and partnerships.

1.2.7 Finance Division

The Finance Division is responsible for HRSD's general financial and business functions, including financial reporting, investment portfolio, treasury, debt, and risk management, maintaining the business side of enterprise systems, and customer billing. The Finance Division has five departments: Accounting, Business Intelligence, Compliance and Risk, Procurement, and Customer Care.

1.2.7.1 Accounting

The Accounting Department is responsible for reporting financial results in compliance with accounting principles generally accepted in the United States, performing the treasury function, preparing the operating budget, selling debt, and performing the payroll, accounts payable and risk management functions.

1.2.7.2 Business Intelligence

The Business Intelligence Department is responsible for maintaining the business side of the enterprise systems and managing the Capital Improvement Program planning and financing.

1.2.7.3 Compliance and Risk Department

The Compliance & Risk Department is responsible for all financial related compliance requirements and work closely with our insurance broker to ensure the appropriate insurance coverage to manage risks.

1.2.7.4 Procurement Department

The Procurement Department sets procurement policy and manages the purchase of equipment, supplies,

and services in compliance with state statutes. The Procurement Department also administers the sale and disposition of surplus property.

1.2.7.5 Customer Care Center Department

The Customer Care Center Department is responsible for sending bills, posting payments, and responding to ratepayers' questions. The Department is responsible for the billing and collection of wastewater treatment charges related to customer accounts. HRSD's customer accounts are established and maintained based on the water and sewer connection information provided by the localities within HRSD's service area. The periodic billing of wastewater treatment charges typically is based on the metered water consumption information provided by the public and private water purveyors serving the citizens of these cities, towns, and counties.

HRSD offers localities a billing service, which provides bill printing and payment processing at no cost to participating localities. Instead of receiving multiple bills, customers receive one bill. This service is called Hampton Roads Utility Billing Service (HRUBS).

1.2.8 Engineering Division

The Engineering Division is responsible for HRSD facility planning, design and construction, and related support. The Asset Management Department manages asset information, including condition, to inform all maintenance, replacement, and capital planning decisions. The Design and Construction Departments work with consultants and contractors to ensure that work is performed in a manner consistent with HRSD's quality standards. The Planning and Analysis Department manages Hydraulic Modeling, Development Services, Geographic Information System (GIS), Data Analysis, Enterprise Data Science and Records Management System and plans the infrastructure required to meet the region's future wastewater needs. The Real Estate section negotiates the acquisition of easements and the purchase of real property for HRSD.

1.2.8.1 Design and Construction Departments

The Design and Construction Departments work with consultants and contractors to ensure that work is performed consistent with HRSD's quality standards, fiscal policies, and environmental commitment. The Chief Engineer has procurement authority and oversees the selection of all engineering design work and contractors to construct HRSD facilities. The Engineering Design and Construction Divisions have two documents that guide and detail its procedures: *HRSD Design and Construction Standards* and the HRSD Procurement Policy, which outlines procurement authority and is in accordance with Virginia procurement law. Both of these manuals are in printed form and are also available on the HRSD Intranet.

The department staff members are deployed geographically for projects within the North Shore and South Shore systems and include a department director for each shore. Projects related to SWIFT are managed through the Director of Design & Construction SWIFT. The Director of Design & Construction Special Projects oversees the Special Projects department which is responsible for CIP projects not being handled by the other Design and Construction Departments.

Generally, when a CIP project is initiated, employees from the Operations Division are involved in both the engineer selection and the design review process. Depending on the project size, other involved parties may include a representative from the DEQ and a representative from the Locality where the construction will take place. This enables stakeholders to become familiar with all aspects of the design and have a better understanding of the project as they review the plans and specifications for permit approvals.

HRSD construction and rehabilitation projects are normally supervised and inspected through a contractual arrangement with the design engineer, but smaller projects are occasionally inspected by in-house staff. As part of the plans and specifications for new projects, strict procedures for testing the facilities are implemented and overseen by the design engineer, engineering staff project manager, and inspector. As stated in *HRSD Design and Construction Standards*, HRSD operates and maintains an interceptor system and the Localities operate and maintain their own collection systems (except for the small

community systems).

Once projects are completed by the Engineering Division, appropriate documentation is maintained in the GIS. This information is accessible through the HRSD Intranet and is incorporated into the GIS as necessary. The Engineering Division oversees any warranties on equipment or construction for the period stated in the construction documents.

1.2.8.2 Planning and Analysis Department

The Planning and Analysis Department is responsible for GIS, hydraulic analysis, data analysis, and long-range planning and coordination with the Localities HRSD serves.

1.2.8.2.1 GIS/CAD

The GIS/CAD (Geographic Information Systems/Computer-Aided Design) Section is responsible for managing record drawings of HRSD infrastructure and for implementing and maintaining an extensive GIS. The GIS contains asset information about the interceptor system and treatment plants. This information includes year built, type of material, diameter, installation date, and asset rehabilitation information. GIS data is used for spatial analysis and is utilized in support of the Computerized Maintenance Management System (CMMS) and the Regional Hydraulic Model (RHM). An extensive numbering system that identifies all of the HRSD system is currently in place. As new facilities are added, the GIS is updated to reflect the changes.

The GIS/CAD section also maintains digital record drawings for HRSD's infrastructure. Copies of the drawings are accessible through the Internet and by request. Field crews are equipped with mobile devices and are able to download record drawings in the field. Three dimensional models of new infrastructure are also available when such models were developed to support their design and construction.

1.2.8.2.2 Hydraulics and Capacity Section

The Hydraulics and Capacity Section (HCS) is responsible for model management, development services, and system planning. HRSD is continuously enhancing a regional hydraulic model using DHI's MIKE URBAN software. This model provides a dynamic tool that is used to evaluate system capacity, perform facility sizing, and make operational decisions such as flow routing. HCS manages Development Services to ensure review of local projects for proper flow calculations and for conflicts with HRSD infrastructure. Flow acceptance reviews are completed by the HCS with input from Operations.

The HCS also reviews and documents sanitary sewer overflows that occur from HRSD's system. The regulatory reporting is maintained within TSD but evaluation and tracking resolution is completed by this section.

1.2.8.2.3 Data Analysis

The mission of the Data Analysis Section (DAS) is to meet regulatory, analytical, and reporting requirements, for the enhancement of the Regional Sanitary Sewer System. The DAS collects, analyzes and provides environmental and wastewater collection data, such as flow, pressure, rainfall, pump run times, and conductivity to HRSD and surrounding localities. In an effort to bring added value to the way HRSD conducts business, the DAS has created dashboards and meaningful displays and reports which allows a user to quickly and efficiently view data. DAS audits MOM metrics and coordinates the MOM updates.

1.2.8.2.4 Enterprise Data Science

The mission of the Enterprise Data Science section is to identify, access, and configure various HRSD and external data sources to visualize information, facilitate analysis, and increase knowledge that helps HRSD provide better service and value. The work of the EDS section provides context and understanding for HRSD decision making.

1.2.8.3 Asset Management Department

The Asset Management Department manages asset information, including condition, to inform all

maintenance, replacement, and capital planning decisions. Asset information includes collected corrosion and failure mode data to complete forensic engineering and to put measures in place to reduce the cause and consequences of asset failure or degradation.

1.2.8.4 Real Estate

The HRSD Real Estate Managers negotiate the acquisition of easements and the purchase of real property needed for pipelines, pump stations, treatment plants and other facilities. The Real Estate Managers also work with property owners during or after construction to resolve any problems.

HRSD normally obtains an independent appraisal by a member of the Appraisal Institute to establish the value of a property, presents an offer to the landowner when attempting to purchase easements or real property, then negotiates the actual price. Consideration is given to such things as crop damage, removal of fences and damage to landscaping. All sales or purchases of property must be approved by the HRSD Commission. Standard easement documentation is used to ensure HRSD obtains the specific rights needed. HRSD's contracted attorney prepares the actual deed and the appropriate records.

In instances where property owners refuse to respond to a request for an easement or are unreasonable in their demands, as a last resort HRSD can condemn the property. A "take" is filed and the appraised value is recorded with the court. Then HRSD has the right to obtain the property. A court action uses a citizen's panel to hear the case and decide on the value of the property that both parties must agree to.

The deeds and plats are incorporated into a database that is available on HRSD's Intranet. All deed information will be placed into the GIS, providing rapid access to easement ownership records, and expediting any necessary line work.

1.2.9 Operations Division

The Operations Division is responsible for operating and maintaining all of HRSD's treatment plants, pumps stations, pipelines, buildings and equipment. The Chief Technology Officer, who oversees the development of new technology with a focus on rapid deployment of innovative solutions, is part of the Operations Division. The divisions that comprise the Operations Division are Water Technology and Research, two Electrical and Instrumentation Department (E&I), Support Systems, three Treatment Divisions, the Small Communities Department for the Middle Peninsula, Surry, and the Eastern Shore and two Interceptor Systems Departments on the North and South Shores.

1.2.9.1 Electrical and Instrumentation Departments

Two Electrical & Instrumentation Divisions consists of both North Shore & South Shore operations that provide services to all HRSD's facilities. The division is responsible for the operation, and maintenance of all Electrical and Instrumentation assets at treatment plants, pump stations, remote monitoring sites, and administrative areas. They also maintain the Supervisory Control and Data Acquisition (SCADA) alarming system that allows HRSD personnel to remotely monitor and respond to potential issues within the interceptor systems. The division performs preventive maintenance, regularly, on rain gauges, flow meters, level sensors, pressure sensors, motors, generators, and various electrical apparatus to ensure regulatory compliance.

1.2.9.2 Treatment Departments

The Treatment Divisions are responsible for the operation and maintenance of HRSD's eight medium size treatment plants which range in size from 15 MGD to 54 MGD. These work centers are grouped geographically. Each division is overseen by a Director of Treatment with assistance of Treatment Process Engineers who focuses on complex wastewater treatment challenges. The daily operations of each plant are overseen by two superintendents: one primarily focusing on operations and the other primarily on maintenance activities. Each work center is staffed 24 hours per day 7 days per week and the staff are responsible for maintaining all of the mechanical and electrical equipment and control processes necessary to successfully operate the highly complex physical, biological, and chemical processes.

1.2.9.3 Interceptor Systems Departments

The HRSD Interceptor Systems Departments consist of the North Shore Interceptor Department and South Shore Interceptor Department. The departments are responsible for operation and maintenance of pump stations and interceptors in their respective geographical locations. The directors are supported by system managers, interceptor engineers and engineering assistants as well as maintenance crews, pump station crews, and interceptor crews.

The departments are responsible for planning, operating, and maintaining more than 500 miles of pipelines and 90 pump stations in the systems covered by this MOM document that convey wastewater from the Locality-operated collection systems to an HRSD treatment plant. The HRSD pump station count is subject to change as pumping facilities are decommissioned, new pumping facilities are brought online and/or interim pumping facilities are deployed as necessary to complement the system. The divisions provide day-to- day monitoring and response to problems to minimize or prevent leaks and overflows. They also provide preventive maintenance, interceptor inspections, replacements, and renovations.

System Managers and Interceptor Engineers evaluate design plans and conduct performance inspections to ensure compliance with HRSD's standards and policies. They evaluate possible flow diversions and notify appropriate parties if implemented. Based on operational experience, Interceptor Engineers aid the CIP process by identifying projects from system needs and reviewing system impacts for CIP coordination.

Interceptor Engineers also provide engineering support to operating personnel.
Maintenance crews perform pump station and interceptor maintenance repairs and projects. These groups utilize heavy equipment and other resources to make repairs to the pump stations, force mains and gravity lines. Spare parts inventories consisting of pipe and pump parts necessary to keep the system operating are maintained. Emergency contingency plans are in place to react to situations that may arise; crews are available to respond day or night. Maintenance records of all work performed are kept. They receive alarms from the SCADA system and respond as necessary to correct those situations. Crews respond to customer inquiries to determine if complaints are related to problems within the interceptor system.

Pump Station crews perform the preventive and routine maintenance of the pump stations. Pump station crews also look at the feedback from the SCADA system to determine whether the pump stations are working properly. They keep track of the set points for operation of the pumps and maintain the pressure reducing station settings. Odor control systems are monitored and maintained, and wet wells cleaned periodically. The pump station crews test emergency power and ensure that any other parameters required for operation during coastal storms are in place and functioning properly before the storms hit.

Interceptor Crews oversee the actual operation and maintenance of the force mains, gravity system and odor control systems. These crews maintain and operate valves, air vents and other mechanical devices in the systems. The locations of valves in the system are tracked through valve guides. Air vents are operated regularly to vent gases that accumulate in the interceptors. Repair reports identify where, when, and what type of repair was made. They also maintain HRSD right-of-way (ROW) rights and easements by mowing and brush clearing.

1.2.9.4 Support Systems Department

The Support Systems Department is comprised of the Automotive, Carpentry and Machine Shops, Facilities Maintenance, Solids Hauling group and Infrastructure Assessment. The department provides services to all of HRSD's facilities including the treatment plants, pump stations and administrative areas.

1.2.9.5 Small Communities Departments

The Small Communities Department – Middle Peninsula (SCD MP) is responsible for the operation and maintenance of four small treatment plants (each treat less than 0.5 MGD) and their associated collection

system including approximately 77 miles of pipe and 36 pump stations. The individuals assigned to this work center are responsible for maintaining all of the mechanical and electrical equipment and control processes necessary to successfully transport and treat the wastewater. The SCD MP has a separate MOM Program that reflects their specific operating practices.

The Small Communities Department – Surry is responsible for the Surry collection system including approximately 33 miles of pipe and 10 pump stations. Because of their proximity to Surry County, daily operation of the collections facilities are operated under contracts with the Sussex Service Authority (also a political subdivision of the Commonwealth of Virginia created to operate and maintain wastewater and water treatment systems). A pipeline to carry all flow from the Surry Service Area to its Nansemond Treatment Plant was constructed and closed both treatment plants in December 2022.

The Small Communities Department – Eastern Shore is an expanding area of the HRSD service area. HRSD acquired ownership for two small treatment facilities, one in the Town of Chincoteague and one in the Town of Onancock. HRSD acquired the Nassawadox Treatment Plant and built an interceptor pipeline to send flow from Nassawadox to the Onancock Treatment Plant. HRSD has also started accepting flow from Exmore and Accomack County which is being treated at the Onancock Treatment Plant.

1.2.9.6 Water Technology and Research Department

The Water Technology and Research Department is managed by a division Chief and the Director of Process Engineering. This department is responsible for overall technical direction within HRSD, but primarily focuses on treatment objectives and process-related topics and issues. This includes operational optimization, capital planning for process upgrades, process engineering and modeling, and innovative technology development, testing, and implementation. This department is also responsible for coordinating applied technology-based research with graduate student interns, state and national universities, plus national and international research groups. In addition, this division is responsible for effective application of research to the day-to-day operations of HRSD treatment plants.

1.2.10 Water Quality Division

The Water Quality Division's mission is to provide quality environmental services to support HRSD and its partners. This division helps ensure compliance with HRSD environmental permits and leads regulatory advocacy efforts through the work of three divisions. The Central Environment Laboratory (CEL) Department provides analytical support for numerous monitoring, research, and regulatory purposes. The Pretreatment and Pollution Prevention (P3) Department monitors wastewater conveyed to treatment plants and implements its Industrial Wastewater Discharge Regulations to protect interceptor systems and treatment plant staff, facilities, and processes. The Technical Services Department is responsible for a number of activities including environmental monitoring, specialized sampling, treatment process and research studies as well as all reporting required by HRSD permits.

1.2.10.1 Central Environmental Laboratory Department

The CEL Department is responsible for all HRSD analytical testing and provides laboratory tests for internal analysis and regulatory control. The state-of-the-art CEL uses the latest approved technology to support monitoring treatment processes, industrial discharges into the system and the condition of local waterways.

The CEL maintains a state accredited quality assurance program and uses methods and procedures in compliance with state and/or federal regulations and guidelines. The CEL also supports the Localities by providing comprehensive analytical services, quality assurance evaluations and consultation on analytical methods and data interpretation through HRSD's Municipal Assistance Program.

1.2.10.2 Pretreatment & Pollution Prevention Department

The P3 Department works with all industries in the region, as well as military facilities, to limit discharge of industrial waste and unacceptable levels of infiltration/inflow (I/I) to the HRSD interceptor system. P3

monitors waste discharges through regular sampling and surcharge surveys. P3 has the authority to bill customers for high strength discharge which is beyond typical domestic waste that is delivered to the HRSD's system. P3 works closely with these different industries and helps them, to the extent allowable, to improve the quality of their discharge. P3 also works with all the Federal Facilities in the area and currently has a program to issue I/I orders, requiring them to perform SSES or flow studies to determine if their systems are in a state of repair that may be introducing unacceptable levels of I/I to the sewer system, and to eliminate I/I sources.

The P3 Department also manages HRSD's Fats, Oils and Grease (FOG) Program. This program includes inspection, enforcement, education, and outreach in coordination with the Localities. The FOG program is further detailed in Section 3.7.

1.2.10.3 Technical Services Department

The Technical Services Department is responsible for environmental testing, data analysis, regulatory negotiation, reporting and administration of air and water permits, management of facility storm water support programs and performs special studies to support operations. The division has watercraft from which they can monitor receiving waters to determine relationships, if any, between discharges from HRSD facilities and local waterways.

HRSD's Municipal Assistance Program is designed to provide local municipalities and agencies with access to the technical and scientific resources available at HRSD at no cost to HRSD rate payers. TSD, as part of this program, offers a variety of services, including consultation on air and water quality and permit compliance issues, as well as monitoring and analysis assistance.

1.2.11 Information Technology Division

The Information Technology Division is responsible for HRSD's business network and associated infrastructure, as well as the security and integrity of same. The divisions that comprise the Information Technology Division include the Enterprise Data Services Division, Information Technology Operations Division, and Cybersecurity Division.

1.2.11.1 Enterprise Data Services Department

The Enterprise Data Services Department is responsible for enterprise software application integration, support, maintenance, as well as project management relating to major business platform implementations and upgrades.

1.2.11.2 Information Technology Operations Department

The Information Technology Operations Department is responsible for information systems management and provides maintenance and operation of HRSD's wide area network, local area network, information management systems, telephonic and cellular communication platforms, as well as software application support for mid-tier and personal computer platforms.

1.2.11.3 Cybersecurity Department

The Cybersecurity Department is responsible for developing, implementing, maintaining, and modifying a standards-based, scalable, flexible, and robust cybersecurity program to ensure the integrity and reliability of HRSD information technology infrastructure.

1.2.12 Talent Management Division

The Talent Management Division attracts new talent, develops talent, and retains existing talent. The Division maintains employee records, handles employee recruiting and orientation, administers employee benefits, oversees training, and ensures employee safety.

1.2.12.1 Human Resources Department

The Human Resources Department partners and supports work centers in all aspects of Human Resources

activities; manages employee records, handles employee recruiting and orientation, and administers the employee benefits programs. In addition, this division reviews job classifications and compensation, manages Workers Compensation and oversees employee policy administration.

1.2.12.2 Learning and Development Department

The Learning and Development Department oversees HRSDs quality program; recruits, trains, and manages HRSD's facilitators; carries out work center annual planning to support HRSDs business and strategic plans; and manages leadership, supervisory and quality training programs and administers the apprenticeship program.

1.2.12.3 Safety Department

The Safety Department is responsible for the overall safety program of all HRSD Divisions. Staff performs safety inspections and develops programs to assist HRSD facilities and workers in meeting requirements and ensuring a safe work environment. The division is responsible for investigation of all work-related accidents, and reports of unsafe work conditions; performs testing, inspection and/or evaluation of safety equipment, facilities, and construction activities; and provides many levels of training to employees on safety, health and first aid. The Safety Department ensures programs meet Virginia Occupational Safety and Health Administration (OSHA) standards and requirements. The Safety staff is involved in activities related to ensuring the security of facilities and the overall disaster preparedness effort.

2. OPERATIONS & MAINTENANCE PROGRAMS

2.1 Sanitary Sewer Overflow Response, Reporting and Recordkeeping Program

2.1.1 Program Definition and Purpose

The purpose of the SSO Response, Reporting and Recordkeeping Program is to prevent or reduce the environmental or public health impact of SSOs by providing structured guidance for release response, reporting of SSOs, and accurate recordkeeping of SSOs. The Consent Decree defines three relevant terms to this program as follows:

> "Regional Sanitary Sewer System" or "Regional SS System" shall mean all of the wastewater collection and transmission systems, including all pipes, Force Mains, Gravity Lines, Pumping Stations, Pressure Reducing Stations, manholes and appurtenances thereto, which are owned or operated by the Localities as well as the HRSD SS System. Regional SS System therefore refers to all portions of the individual Locality and HRSD collection and transmission systems and appurtenances thereto. Sewer laterals from buildings are not considered part of the Regional Sanitary Sewer System.
>
> "Sanitary Sewer Overflow or SSO shall mean an overflow, spill, diversion, or release of wastewater from or caused by the Regional Sanitary Sewer System. This term shall include:
> (i) discharges to waters of the State or United States from the Regional Sanitary Sewer System and (ii) any release of wastewater from the Regional Sanitary Sewer System to public or private property that does not reach waters of the United States or the State, including Building/Private Property Backups."
>
> "Sanitary Sewer Discharge or SSD shall mean any discharge to the waters of the State or the United States from the HRSD Sanitary Sewer System through a point source not authorized in any permit."

HRSD responds, reports, and keeps records on SSOs and SSDs from its system. The Localities have the responsibility under State law to respond, report and keep records on releases from their sanitary sewer systems.

In 2014, HRSD entered into a Memorandum of Agreement (MOA) with the Localities that defines the roles and responsibilities for the development, financing and implementation of the Regional Wet Weather Management Plan and the provision of adequate wet weather sewer capacity in the regional system in the future. The MOA contains several provisions for capacity-related sanitary sewer overflows that assign responsibility for investigation, regulatory liability, and claims reimbursement. Localities were responsible for all SSOs in their systems. HRSD and the Localities agreed to cooperate in investigating capacity-related sanitary sewer overflows to determine the actual cause(s) and the appropriate response. With the First Amendment to the MOA dated April 12, 2018, HRSD assumed "regulatory liability for Wet Weather Overflows occurring within the Regional Sewer System following approval by the Court of the RWWMP."

HRSD's current plan for response, reporting and recordkeeping related to conveyance system SSOs is included in Appendix D.

In addition, HRSD has established procedures for response, reporting and recordkeeping of releases of untreated or partially treated wastewater at the sewage treatment plants (STPs). Section 2.14 documents the Response Plans for the STPs which include releases at the plant. In general, these releases, where required, are reported under the requirements of the facility's VPDES permit.

2.1.2 Goals and Performance Measures

The goals of HRSD's SSO Response, Reporting and Recordkeeping program are to:

- Ensure the welfare and safety of the public and the environment.
- Provide a protocol for responding, tracking, documenting, and resolving each event; and
- Meet regulatory reporting and recordkeeping requirements.

	Goals	Performance Measures	Target Value
SSO Response	Protect the welfare and safety of the public and the environment by responding as soon as possible to Sanitary Sewer Overflows.	Respond within 2 hours when conditions are safe. (No. of SSD responses meeting goal / No. of SSD events per year) (%)	100%
SSO Release Reporting	Meet initial regulatory reporting requirements of the DEQ for SSDs within the HRSD Sanitary Sewer System.	Provide an initial notice within 24 hours. (No. of reports meeting requirement / Total No. of reports per year) x 100%	100%
SSO Response Training	All personnel whose duties require SSO Response, Reporting, and Recordkeeping are properly trained annually.	Provide annual training to all involved personnel. (No. of employees trained annually /No. of employees involved) x100%	100%
SSO Mapping	Input all SSDs and Locality SSOs into GIS. Include all SSDs reported through Sanitary Sewer Overflow Reporting System (SSORS) in GIS system for tracking and analysis.	(No. of SSDs added to GIS per year/Total # of SSDs reported to SSORS) x 100%	100%
SSO Resolution Plans	Each SSO event should be evaluated for potential resolutions and assigned to an Action Plan within 90 days of event.	(No. of SSO resolution plans developed and issued within 90 days /Total # of SSOs reported to SSORS) x 100%	100%

2.1.3 Program Description and Components

The SSO Response, Reporting and Recordkeeping Program establishes the procedures for responding to a SSO and providing notification which are described in detail in the Sanitary Sewer Overflow Response Plan (SSO RP) located on www.hrsd.com or a summarized version included in Appendix D. The SSO RP is updated as required and can be accessed electronically through the HRSD's Intranet site as well as www.hrsd.com. The plan provides structured guidance on addressing SSOs (including response protocol and flow retrieval, abatement, and clean up techniques), regulatory agency notification (including reporting procedures during normal and non-business hours), training, and reporting of non-HRSD SSOs. It includes guidance on the resolution of SSOs, which is a multi-step process to evaluate the incident and determine what follow-up actions are necessary. The plan also provides a list of available equipment for release response and a comprehensive phone directory. Procedures on addressing SSOs/backups in a Locality as a result of HRSD's sanitary sewer system are also described in the SSO RP and include:

- Receipt of information.
- Field staff response.
- SSO containment, repair and clean up.
- Documentation.
- Regulatory reporting.
- SSO tracking.

- SSO resolution; and
- System pressure monitoring and record keeping.

Should a SSO in a Locality system be attributed to HRSD's sanitary system, HRSD will work in conjunction with the Locality to mitigate the impacts of the SSO and participate in ongoing review of problem areas.

SSD occurrences are tracked and documented in the on-line notification and reporting system called Sanitary Sewer Overflow Reporting System (SSORS), as well as the HRSD GIS. Priority for additional maintenance or condition assessment is given where recurring problems have been documented.

The main objectives of personnel responding to an SSO are to eliminate, contain, recover, disinfect, assess, restore, and report properly. These objectives are described by the following:

- Stop: First priority is to stop the SSO.
- Contain: In order to limit the area of impact, field personnel will contain the SSO as much as possible. This can be accomplished with straw bales, earthen berms, booms, etc.
- Recover: Attempt to recover as much of the SSO as possible using vacuum trucks, pumps, etc.
- Disinfect: After the spill has been contained and recovered, the area of impact should be disinfected with lime if appropriate.
- Assess: Field personnel will assess the amount of spill that was recovered and how much was released for reporting purposes.
- Restore: The site should be restored to its original state to the maximum extent feasible.
- Report: The reportable SSO amount must be reported to DEQ.

The SSO RP, kept internally on HRSD's Intranet site and www.hrsd.com, provides detailed protocol to address achieving the objectives listed above.

From a regulatory compliance standpoint, a critical function of the response team is to consistently and properly report a spill to DEQ. If a responder is uncertain as to whether a release is reportable, he or she will err on the side of caution and report it. Below are some definitions frequently used within the SSO Response, Reporting and Recordkeeping Program:

- SSO: an overflow, spill, diversion, or release of wastewater from or caused by the Regional Sanitary Sewer (SS) System. This term shall include: (i) discharges to waters of the State or United States from the Regional SS System and (ii) any release of wastewater from the Regional SS System to public or private property that does not reach waters of the United States or the State, including Building/Private Property Backups.
- Reportable SSO: the unauthorized intentional or unintentional spill, release, or discharge to waters of the State or United States of untreated wastewater from any portion of a sanitary sewer system before the headworks of a wastewater treatment facility.

2.1.4 Training

HRSD personnel that have the responsibility of responding to an SSO/SSD or involvement with SSO/SSD reporting will receive training on an annual basis. The training will be targeted to the involvement of the group. For instance, responders will receive training on response, containment, clean up and reporting.
Persons involved in reporting and recordkeeping will receive training in those topics. Additional topics include follow-up and resolution.

2.1.5 Information Management

HRSD and all the Localities in Hampton Roads worked jointly with the Hampton Roads Planning District Commission (HRPDC) and the DEQ to develop and implement the Internet-based SSORS.

HRSD operators in the field alert the Permits Manager of any SSDs that have occurred, and the Permits Manager sends the information to DEQ via the SSORS database email. Upon their receipt of the email, DEQ assigns the event a reporting number. HRSD then has five calendar days to submit a final report utilizing

SSORS.

This system allows the reporting entity to define what happened and receive a case number from DEQ. Then a follow up report, clearly defining the incident and the resolution, is filed within five calendar days. When the report is filed, copies are sent to everyone on the regulatory distribution list. HRSD can review all reports including Locality reports; each Locality can view their own reports and reports of any HRSD incidents that occurred within their Locality. A database is maintained that contains the history of the spills. Procedures to use the SSORS system are further defined in the SSO RP.

2.1.6 Resource Management

Employees are assigned to the SSO Response, Reporting and Recordkeeping Program during normal business hours as partial duty. Please refer to Appendix A for identification of staff that is responsible for the execution of this program. The Chiefs of Interceptor Operations are responsible for managing the Response portion of the program. The Chief of Operations, Chief of Water Quality, and Chief Engineer are also responsible for managing the Reporting and Recordkeeping program.

During non-business hours, stand-by crews are designated on a rotating basis as first responders for SCADA alarms and emergency contact (via text messaging).

In an emergency situation, HRSD can initiate special procurement or contractual processes to access additional resources from outside contractors or other nearby utilities as needed.

2.1.7 Process for Continuous Improvement

The SSO Response, Reporting and Recordkeeping Program and the SSO RP document will be evaluated and revised, if necessary, annually.

2.1.8 Implementation Plan

Program Milestone	Time Frame
Evaluate and Update SSO Response Plan (SSO RP)	Annually

2.2 Infiltration and Inflow Abatement Program

2.2.1 Program Definition and Purpose

The purpose of the I/I Program is to identify and reduce or eliminate, as practical, stormwater, groundwater, or other non-sanitary sewage sources of water entering HRSD's sanitary sewer collection system. In turn, by reducing or eliminating these extraneous system flows, HRSD is working to reduce or eliminate the potential for sanitary sewer system overflows in the system they own. Each Locality is responsible for their own MOM program and to repair all significant defects that may be sources of I/I under the terms of the MOA.

HRSD is managing and executing an I/I Program for HRSD assets. When capacity-related overflows or system backups occur within the Locality-owned systems, it is incumbent upon the Locality to contact HRSD.

HRSD's I/I Program is centered on removing extraneous system flows from HRSD owned assets. Through CCTV inspection, sewer system modeling, HRSD's Flow, Pressure and Rainfall (FPR) Monitoring Program, temporary metering in areas of suspected concerns, conductivity monitoring for salt water and tidal inflow, and through empirical evidence, HRSD identifies and prioritizes sewer system areas of concern. In addition, wet weather-related overflows are tracked to identify areas of the system that may experience high levels of I/I. In conjunction with the Aquifer Replenishment Program, some areas may be addressed for I/I removal where that I/I also contributes high levels of chlorides and/or bromides as these can have negative impacts on the quality of the Aquifer Replenishment Program water.

HRSD reviews potential I/I sources within its gravity system. The primary means of identifying these sources is CCTV inspection, review of pump station records and flow monitoring results. Where I/I into HRSD's system is determined to be significant based on findings from condition assessment inspections, HRSD will schedule rehabilitation work to mitigate the I/I. Documented defects related to I/I with a National Association of Sewer Service Companies (NASSCO) PACP rating of 4 and 5 will be deemed significant. For example, defects coded as 4 or 5 may include infiltration runner and gushers as well as large intruding roots, intruding tap break-ins or holes. HRSD acknowledges that potential I/I sources can extend beyond the gravity system and will evaluate additional sources such as pump station wet wells and treatment plant drains; if significant I/I sources are identified at pump stations or STPs, remedial measures will be implemented to reduce/eliminate these sources.

The various terms used to describe extraneous surface and/or ground water in the sewerage system are defined as follows:

- Infiltration: Water entering the sewerage system from such sources as defective sewer pipe joints and connections, cracked pipes or defective manhole walls and other sources of leaks into the system.
- Inflow: Water entering the system from such sources as roof drains, basement drains, yard and area drains, direct connections from storm sewers, flow through manhole covers and sewer clean outs, and other sources directly connecting storm water flow to the sewerage system.

2.2.2 Goals and Performance Measures

The goals of the Infiltration and Inflow Abatement Program are to:

- Identify and mitigate significant sources of I/I into the HRSD gravity system.
- Schedule rehabilitation to address significant levels of I/I in the HRSD gravity system; and
- Rehabilitate significant I/I sources in the HRSD gravity system within 5 years of discovery.

2.2.3 Program Description/Components

HRSD is operating under a Consent Decree with EPA and the Commonwealth of Virginia to reduce sanitary sewer system overflows through creation of, and execution of, the Regional Wet Weather Management Plan that reduces peak wet weather flows and provides additional capacity. HRSD's ongoing practices as part of

this program include assessing system assets for I/I.

2.2.3.1 Shallow Wells

HRSD maintains a network of shallow wells, typically located at various pump station sites throughout the HRSD service area. The complete list of shallow wells maintained by HRSD is updated in the CMMS. The bottom of each well is located below the invert elevation of the influent sewer line at the particular site. The top of the well pipe is enclosed within a standard HRSD air vent casting. The purpose of these shallow wells is to monitor the elevation of the ground water table at each site. This can provide a correlation between the rates of infiltration on the influent gravity system and the elevation of the ground water table in a particular area. The elevation of the ground water table is obtained at each site by wireless telemetry or may be downloaded directly onto a laptop computer. The Planning and Analysis Department monitors these installations and E&I maintains the monitoring devices.

2.2.3.2 Field Investigations

2.2.3.2.1 Smoke Testing

In some cases, HRSD uses smoke testing to diagnose sources of inflow. Due to the physical nature of HRSD's system, e.g. the predominance of pressure systems, smoke and dye testing have limited applicability. However, there may be occasions where these investigative tools are employed by HRSD to identify sources of inflow or leaks into the system. Smoke testing is one of the most efficient and cost-effective methods of locating sources of inflow connected to the sewers, and to evaluate odor issues. The non-toxic smoke serves as a visual tracer to help locate places where storm and other surface waters enter the sanitary sewers. Smoke testing is conducted by placing a blower over a centrally located manhole and forcing the smoke-filled air through a sewer line. The smoke will fill the main line plus any connections, then follow the path of any leaks to the ground's surface, quickly revealing the source of inflow. The smoke may be noticeable where there are leaks from a cracked sewer pipe, a broken cleanout cap or a defective or damaged manhole, when a roof drain is connected to the sanitary sewer or when there is a cross connection between a storm sewer and a sanitary sewer.

2.2.3.2.2 Closed Circuit Television (CCTV) Inspection

CCTV inspection is a non-destructive, proactive approach to evaluate the HRSD pipeline infrastructure and is used when observed data is necessary to assess the condition of the pipeline interior. It can be an effective way to locate active and potential sources of I/I. CCTV is used to inspect HRSD gravity pipelines. Operators of the CCTV system are certified in the NASSCO Pipeline Assessment and Certification Program (PACP) and use the PACP rating system to identify the severity of the defects found during the inspection process. PACP defect coding provides a level of consistency in the defect rating; therefore, HRSD and others reviewing the inspection records can understand and use the information accordingly. More information on the gravity sewer inspection program is included in Section 2.9 of this document.

2.2.3.2.3 Dye Testing

Dye testing is another technique used to trace I/I sources within the sanitary sewer system. Dye is inserted in the suspected I/I sources. Traces of the dye can be seen in the sanitary stream if there is a cross-connection or leak. Dye testing is often used to verify sources that tested positive during smoke testing. Dye testing is most effective in identifying specific sources of I/I if performed in conjunction with CCTV inspection.

2.2.3.2.4 Saltwater Intrusion Investigations

HRSD has strategically placed conductivity sensors throughout its monitoring network to analyze baseline conductivity in the sanitary sewer system as well as potential saltwater intrusion. The Planning and Analysis Department personnel utilize data visualization software to review and analyze data to determine saltwater intrusion during "normal" tidal events and high tide events. Concurrently, they analyze sewer flow and tide level data to determine a correlation, estimate saltwater inflow, and inform the Technical Services Department's conductivity meter

deployments and saltwater inflow source tracking efforts. Through this desktop analysis, the Planning and Analysis Department works in conjunction with the Pretreatment & Pollution Prevention and Technical Services Departments to strategically sample and monitor the conductivity of HRSD owned, Locality owned, and privately owned collection systems. See section 4.5 for more information pertaining to this program.

2.2.3.3 Resolution Techniques

Sources of I/I are addressed by completing various rehabilitation techniques that are specific to the area and the type of defect or condition present at each location. These rehabilitative techniques generally include the elimination of illegal/cross connections, sewer pipe spot repairs, sewer pipe replacement, sewer lining, manhole rehabilitation through lining, grouting, chimney sealing or replacement, and wet well rehabilitation using pressure grouting, sealing, or concrete repair and replacement.

2.2.4 Training

HRSD personnel involved with the I/I Abatement Program are typically trained and certified through the NASSCO Pipeline Assessment & Certification Program/Manhole Assessment & Certification Program (PACP/MACP). Program personnel also receive on-the-job training as needed.

2.2.5 Information Management

The North Shore and South Shore Interceptor Systems personnel utilize data visualization software to review and analyze data in addition to various spreadsheets and databases developed through the course of operating and maintaining the sewer system.

HRSD staff overseeing the CCTV system contract are certified in the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) program.

The Water Quality Division maintains documentation of investigative work they are completing. These records are stored on HRSD's network.
The Engineering Division maintains documentation of investigative work they are completing. These records are stored on HRSD's network.

2.2.6 Resource Management

Although the responsibility of the I/I Program within HRSD spans across several departments, the overall lead for the program is the Chief Operating Officer. The Operations Division, Engineering Division and Water Quality Division provide resources for the program.

The responsibilities for these work centers are split between various I/I Program efforts including CCTV investigations and flow monitoring activities. The P3 Department's employees contribute to completion of HRSD's I/I Program as a partial duty. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

2.2.7 Process for Continuous Improvement

Continuous improvement for the I/I Program includes the following.

- HRSD will continue to pursue the identification and reduction/elimination of extraneous wet weather flows and defects contributing I/I in their system as part of their ongoing I/I Program.
- HRSD staff will continue to consult with Locality collection system owners to identify the probable underlying cause(s) of Locality system overflows and backups.
- HRSD will continue the execution of the Federal Facilities Program to consult with the Federal Facilities in HRSD's service area to reduce system flows in these federally owned systems, thereby reducing flows that are tributary to HRSD's system. The Federal Facilities Program results from HRSD's broad authority to control flows into their sewer system and HRSD will enforce these broad

powers through orders with individual federal facilities as required. Refer to section 4.10 for further information pertaining to this program.

2.2.8 Implementation Plan

Program Milestone	Time Frame
Federal Facilities Program	Ongoing
Saltwater Intrusion Program	Ongoing

2.3 Flow, Pressure and Rainfall Monitoring Program

2.3.1 Program Definition and Purpose

HRSD's Flow, Pressure and Rainfall (FPR) Monitoring Program was established to collect data of sufficient amount, scope, and quality to maintain and manage system performance and reliability as well as to support HRSD's development, calibration, and verification of the Regional Hydraulic Model, HRSD's assessment of Sanitary Sewer System capacity, and the implementation of an Integrated Plan.

HRSD has submitted an FPR Monitoring Plan that has been approved by EPA and is an attachment to the Consent Decree. The monitoring period for the Consent Decree was completed from March 2010 through March 2011 and the data was used to construct and calibrate the Regional Hydraulic Model. Since that time, HRSD has continued to operate a FPR Monitoring program with addition, deletion and relocation of metering sites occurring periodically, as needed.

2.3.2 Goals and Performance Measures

The purpose of HRSD's FPR Monitoring Program are to:

- Monitor pipeline pressures and flows in HRSD's wastewater collection and transmission system.
- Monitor collection system performance and integrity.
- Provide data to maintain HRSD's Regional Hydraulic Model; and
- Provide data for the Regional Wet Weather Management Plan (RWWMP).

Additionally, the FPR program:

- Provides data for better operating decisions.
- Provides data for site specific capacity analyses; and
- Provides data access for the Localities.
- Measures other relevant data as it pertains to characterization of hydraulic, process, and treatment related information (e.g. tide levels, ground water levels, conductivity, etc.)

Goals		Performance Measures	Target Value
FPR Flow & Pressure Meter Data Quality	Obtain quality flow and pressure data for system performance assessment.	Meet the Data Quality Standards in the Data Quality Standards and Procedures (DQSAP).	Each flow and/or pressure sensor owned and maintained by HRSD is expected to have at least 75% reliable data in at least 90% of each type of site (flow or pressure) for select dry weather weeks and obtain 90% reliable data in the aggregate during select wet weather conditions.
FPR Flow and Pressure Meter Maintenance	Maintain flow and pressure measuring equipment to collect data of sufficient quality to maintain and manage system performance and reliability	Maintain / adjust in-service pressure and flow measurement equipment annually. (No. of procedures performed / No. of procedures required) x 100%	100%
FPR Rainfall Monitoring Equipment	Maintain rainfall measuring equipment to collect data of sufficient quality to accurately capture the data necessary to build a well-calibrated model.	Maintain / adjust in-service rainfall measurement equipment annually. (No. of procedures performed / No. of procedures required) (%)	100%

2.3.3 Program Description and Components

The FPR Monitoring program has been designed to:

- Measure flow rates and total amounts of wastewater flow at significant locations in HRSD's force mains.
- Measure flow rates and hydraulic grade lines at significant locations in HRSD's gravity sewers.
- Characterize the performance of HRSD's pump stations and pressure reducing stations.
- Measure pressure conditions in HRSD's force mains; and
- Measure rainfall rates and total rainfall amounts to adequately characterize spatial and temporal variations in rainfall across the modeled portions of HRSD's service area.

2.3.1.1 Rainfall Monitoring

HRSD maintains a network of recording rain gauges located at various strategic sites throughout the HRSD service area. These are used to correlate rainfall data with wastewater flow responses in the HRSD service area. These gauges are the "tipping bucket" type and can provide a pulse output for rainfall in increments of 1 pulse per 0.01 inch. The pulse data is recorded by Telog and transmitted to the top end Telog server or may be downloaded directly onto a laptop computer. This equipment is operated and maintained by the E&I staff.

2.3.1.2 Flow Monitoring

HRSD has continued to implement a FPR Program where meters are installed to enable measurement of flows throughout the system. Additionally, HRSD may utilize various types of portable meters for temporary monitoring in the system's pipelines for the purpose of recording pressure and/or flow data in pipelines. Meters are used in both gravity sewers and force mains and are frequently installed in pipelines in the Localities system, with the Localities' permission. If the data collection requirement for a particular site is for a relatively short period of time, it is simply downloaded at the site onto a laptop computer by E&I staff for later processing and analysis. In other cases where the data requirement is for an extended period of time, the metering site may be equipped with telemetry equipment which allows the transmission of data from the site back to HRSD's data historian for the Master Metering Program. These sites are operated and maintained by HRSD personnel or an HRSD contractor.

2.3.1.2.1 Open Channel Gravity Meters

HRSD contracts various open channel flow meters for monitoring flows in gravity sewers. The typical installation is usually at a manhole or pump station wet well in the gravity system. A stainless-steel band with an attached sensor is inserted into the end of the pipeline at a manhole. The sensor has a velocity sensor and depth of flow (pressure) sensor to calculate the flow in the pipe. The data is stored, and flow is calculated in a data logger unit which is normally suspended just below the manhole cover in a submersion-proof housing. The stored data is transmitted via telemetry communications units or may be downloaded directly onto a laptop computer.

2.3.1.2.2 Pressure Pipe Flow Meters

Various flow meters used in pressure pipe conditions (ultrasonic, acoustic doppler flow meter, magnetic flowmeters) have become valuable assets in monitoring system performance. Ultrasonic sensors can be installed on the outside of the pipe because the signal can penetrate most solid materials. The meters work well on most ferrous and polyethylene-based force mains. Ultrasonic flow meters send bursts of signals through the pipe to measure the velocity of the fluid in the pipe. Magnetic flowmeters require more permanent tapping of the pipe or inline installation.

2.3.1.3 Pressure Monitoring

Pressure transmitters are needed to measure the head pressure in force mains to assist in making operational decisions pertaining to the Pressure Reducing Stations (PRS) and optimizing the force main system. Pressure transmitters are typically installed on the pressure-piping manifold in a pump station. The pressure instruments transmit pressure data to one of several types of data storage units. At the typical air vent installation, a special fitting is utilized on the air vent valve that allows continuous monitoring of system pressures. This equipment, along with a Telog data recorder, is installed within the air vent structure under the cover. The stored data is transmitted wirelessly to a storage warehouse and may also be downloaded directly onto a laptop computer by E&I staff.

2.3.4 Training

Typically, HRSD staff responsible for data analysis and evaluation duties for the FPR Program is trained on all aspects needed to function in that division. New hire employees are trained through on-the-job experience on equipment and/or software used to support their specific activities.

HRSD employees responsible for meter installation, data collection, operations, and maintenance duties under the FPR Program typically attend the Apprenticeship Program which is further described in Section 3.2.

2.3.5 Information Management

There are systems utilized to retrieve, maintain, manage, and store data for the FPR Monitoring Program. HRSD uses a Computerized Maintenance Management System (CMMS) to manage work orders for flow, pressure, and rainfall equipment and store maintenance and calibration records for the FPR Monitoring Program equipment. All data collected through those assets are transmitted via Telog. It is then transmitted via cellular modem to HRSD's Telog server. This data is analyzed and managed by HRSD's Engineering Data Analysis Section (DAS). Telog recorder calibration is verified and documented during the calibrations for FPR instrumentation. Each meter is uniquely identified from the other devices and all data is stored with a time and date stamp in an easily accessible open platform control (OPC) compliant format.

The FPR monitoring program utilizes a time-based data historian for data storage, which is the system of record for the interceptor master metering data that is collected through the Telog system. Data analysts are using a software program to manage the workflow related to reviewing FPR data. This software helps to manage the significant workload associated with data availability and accuracy.

2.3.6 Resource Management

There are numerous employees spanning the Engineering and Operations Divisions assigned to the FPR Monitoring Program as a partial duty. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

Generally, the DAS of the Engineering Division has primary responsibility for data review and quality. The E&I Department has primary responsibility for maintaining and calibrating meters and gauges. Interceptor Systems and/or E&I respond to inquiries from Data Analysis on suspected meter performance issues and to verify operational changes (diversions, etc.) that may impact FPR data. These processes are fully documented in the Data Quality Standards and Procedures (DQSAP). The overall lead for the FPR Program is the Data Analysis Manager.

2.3.7 Process for Continuous Improvement

The FPR monitoring data is evaluated by the DAS in the Engineering Division on a regular basis for potential meter failures. On an annual basis, a review of the existing FPR sites is conducted to determine if changes are necessary. HRSD has previously submitted a DQSAP document that outlines data quality standards and establishes protocols for data screening to identify potential problems or deficiencies with the data. Although not a regulatory requirement for the Consent Decree any longer, HRSD continues to utilize concepts of the DQSAP to provide validated dry weather and wet weather datasets for the Regional Hydraulic Model

2.3.8 Implementation Plan

None identified at this time.

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2.4 SCADA Program

2.4.1 Program Definition and Purpose

The telemetry system that monitors the activities of the pump stations and other components of the collection system is known as Supervisory Control and Data Acquisition (SCADA) and is typically used to monitor system performance and to transmit various types of alarms from the pump stations to central locations to alert the staff of a potential problem.

2.4.2 Goals and Performance Measures

The goals of HRSD's SCADA Program are to:

- Transmit adequate data to alert staff of system issues to prevent and reduce problems such as SSOs.
- Provide emergency alarm response per Sewage Collection and Treatment (SCAT) Regulation 9 VAC 25-790-420 Alarm Systems.
- Maintain adequate SCADA system performance and reliability.

Goals		Performance Measures	Target Value
SCADA Performance and Reliability	SCADA system to provide reliable and consistent control, data, and alarms to effectively manage monitored systems.	SCADA communication uptime to be compared to total time on a monthly basis. [Communication uptime hours / total hours] X 100%.	99% Data Availability (monthly)

2.4.3 Program Description and Components

The HRSD SCADA system monitors performance and a variety of alarms at pump stations and other HRSD facilities. The SCADA system is also used to monitor miscellaneous systems at several HRSD facilities. Implementation of a new SCADA system is currently under way and will be completed in the near future. The older iFix SCADA system is still utilized by sites not yet cut over to the new system. Typical communication in the iFix SCADA system is achieved through radio modems at the sites with several repeaters located throughout the service area to facilitate communication from more remote locations. The new SCADA system (Ovation SCADA) utilizes Verizon 4G communications with new Top-End and local OIT graphics that allow for remote and local control.

The data from the SCADA system is received at central and redundant locations. This configuration provides back-up operations to the master controller in the event communications are disrupted. The data is transmitted between the various HRSD facilities via Ethernet utilizing a 100 Megabit TLS line with a Verizon Cellular 4GLTE back-up.

Several different types of telemetry installations are used by HRSD to transmit data, including:

- Site data recorder with modem, phone line, and commercial power.
- Site data recorder with modem, phone line, and battery power.
- Site data recorder with modem, cellular phone, battery power, and with one of several types of solar recharging systems.
- Other telemetry systems may be used in the future as better technology becomes available.

2.4.4 Training

The requirement for E&I staff responsible for maintaining the SCADA is a two-year degree in instrumentation or an equivalent field of study. Four years of on-the-job training or equivalent experience is also required. Employees are provided on-the-job training and have the opportunity to shadow a more experienced employee until they become knowledgeable and comfortable working alone. Unique attributes and alarm settings for each pump station are kept on local reference sheets, or in accessible network folders to aid

employees while on the job.

2.4.5 Information Management

Incoming SCADA data is analyzed to ensure that the system is reporting quality data. The information received through the SCADA system is stored on HRSD's network server. Current and historical trends are used to analyze system performance and to determine if set points need to be modified.

The attributes and set points for the pump station monitoring system are posted within an Operator Interface Terminal (OIT) at each station and are available electronically. The information is also stored at HRSD's main office on a server.

Hardcopy logbooks are maintained at each station to describe activities that are undertaken daily by anyone entering the stations.

HRSD maintains and populates their Computerized Maintenance Management System (CMMS) including the inventory of SCADA system components, spare parts inventory, and historical data on asset performance, as well as maintenance history.

2.4.6 Resource Management

The SCADA system is maintained by electrical and instrumentation staff and information technology staff E&I Supervisors have the primary role in managing electrical and instrumentation staff and report to a Director of E&I. Information technology staff report to the Chief Information Officer.

Staffing includes E&I staff from the North Shore and South Shore Operations Departments and Data Analysts from the Engineering Department. Please refer to Appendix A for identification of staff that is responsible for the execution of this program. There are typically two E&I Specialist on-call at all times for emergencies. On-call staff has Verizon hot spots and laptops, and VPN tokens for remote access and to increase response time. The staff has access to vehicles which carry a sufficient inventory of replacement parts, so they are readily available when repairs are needed. The Data Analysts and E&I staff are dedicated to monitoring and maintaining the monitoring data received through the SCADA system.

Purchases of major items are evaluated by the SCADA staff and then the request is sent to the Director of E&I for approval. The equipment is procured under the North or South Shore Interceptor Operation's budget.

2.4.7 Process for Continuous Improvement

The SCADA system is currently undergoing an upgrade. Approximately 75% of HRSD's remote, unmanned facilities have been cut over to the new SCADA system. This new SCADA system provides localized and remote monitoring/control, communication with centralized control system (front-end software) via 4G LTE wireless technology, centralized monitoring/control and flexibility for future expansions. The new SCADA system is currently being used to control facilities remotely for enhanced operational effectiveness. In some instances, remote SCADA operations have eliminated SSO's through operators remotely adjusting set points to balance flows within HRSD's system.

2.4.8 Implementation Plan

Program Milestone	Time Frame
SCADA System Upgrades	Upgrades began in 2020 and will be completed by 2025

2.5 Condition Assessment

2.5.1 Program Definition and Purpose

The purpose of this section is to describe the Condition Assessment Program (CAP) for HRSD. HRSD conducts condition assessments of assets within its facilities and systems for the purpose of locating conditions that warrant enhanced protection, enhanced maintenance, repair, replacement, or enhanced monitoring.

2.5.2 Goals and Performance Measures

The goals of HRSD's CAP are to:

- Develop and execute a plan to inspect/assess our assets on an occurrence that is based on risk associated with the asset.
- Develop plans for monitoring condition and planning for repairs/replacement based on risk associated with the asset.
- Collect and store data on condition of our assets that allows our staff to easily use to make planning decisions.

Performance measures related to Condition Assessment are interrelated to other MOM Sections. Section 2.7.2 has condition assessment performance measures related to Pump Stations; Section 2.8.2 has condition assessment performance measures related to Force Mains; and Section 2.9.2 has condition assessment performance measures related to Gravity Mains. Section 2.5.3.2 has condition assessment procedures for Treatment Plant Facilities.

2.5.3 Program Description/Components

HRSD strategically inspects interceptor systems assets (gravity mains, pump stations and force mains) and the treatment plant assets (mechanical, electrical, instrumentation, and structural) to classify the asset's condition to better understand its useful life and identify any deterioration or defects that may reduce its useful life.

2.5.3.1 Interceptor Systems

HRSD completed a multi-year, intensive CAP as a requirement of the Consent Decree. The Consent Decree requirements related to regular condition assessment are as follows:

"Regular condition assessments of HRSD's critical assets as identified in the MOM Plan, including force mains, gravity mains, and pumping stations. With respect to force mains, such assessment shall include:

1. Development of an ongoing program to investigate and improve force main assessment techniques, to include periodic surveys of new technologies and implementation of those techniques which are reliable and cost-effective; and
2. Procedures to carry out force main assessments on an opportunistic basis when repairing force mains, making connections to force mains, etc.; and
3. Review, on an annual basis, of all force main failures from that year to identify any patterns indicating potential risk of failure, and
4. Development of a database of information regarding force main pipe condition data from other sources, such as when a pipe is tapped or replaced, to identify trends or patterns indicating increased risk of failure.
5. For those force mains inspected as part of the Condition Assessment Plan in Section VIII, but found not to present a material risk of failure such that action would be required under that Section VIII, an inspection and maintenance program based upon the findings and information concerning the condition of such force mains obtained during the condition assessment previously performed."

Condition assessment activities are described in detail below for force main interceptors, gravity interceptors, pump stations and pressure reducing stations.

2.5.3.1.1 Force Main Interceptors

HRSD completed a multi-year, intensive CAP for force mains in accordance with the Consent Decree. Force mains were inspected using a variety of technologies, which primarily included acoustic leak detection and wall thickness testing. Upon completion of the force main CAP activities, HRSD established several key components that comprise the regular ongoing condition assessment of force mains. The key components include:

1. **Critical Asset Identification & Assessment** - HRSD performs desktop evaluations of force mains based on historically observed conditions, operational drivers, failure histories and other available data. A risk assessment based on the evaluations identifies force mains considered as "high risk" that are subject to further inspection. Force mains selected for inspection are inspected by conventional and advanced methods as identified in the annual report produced by HRSD containing a force main assessment technology review. As an ongoing requirement of the Consent Decree, HRSD inspects a minimum of 2400 l.f. of force mains within 2,500 ft. of drinking water reservoirs each year.
2. **Opportunistic Assessment** - HRSD conducts condition assessment (such as pipe wall thickness measurements) of force mains when it is opportunistic (e.g. when the pipe is tapped, when a repair is conducted on the main, or is otherwise accessed internally or exposed externally). When a repair is initiated, a portion of the force main is inspected, in both directions, to determine how much pipe needs to be removed to allow for a proper repair and attachment of the new pipe to a sound portion of the main.
3. **Failure Event Analysis** - Each time a failure occurs, HRSD reviews the condition of the pipe in the vicinity of the failure to determine conditions that may have induced the failure. For pipes with conditions that warrant corrective action (e.g., extensive internal corrosion, etc.), HRSD performs additional condition assessment to define the magnitude of the problem and/or schedules the line for rehabilitation or replacement. When possible and practical, representative samples from failed pipe segments are analyzed by visual inspection, any of various pipe wall technologies and/or advanced laboratory testing to inform determination of failure cause. Any results are reviewed by the Asset Management Department. For pipes that fail, representative samples of the failed pipe are collected and analyzed, and the results are reviewed by the Asset Management Department.
4. **Failure Trend Analysis** - On an annual basis, HRSD reviews all interceptor force main (IFM) failures that occurred over the previous year to identify failure trends. This review is led by the Asset Management Department using an ad hoc team that has representatives from Operations and Engineering.
5. **IFM Condition Database** - HRSD maintains a database that captures IFM pipe condition data. This includes pipe wall thickness measurements, locations of acoustic leak detection inspections, air pocket locations and locations where pipe samples ("coupons") were collected.
6. **Periodic Force Main Inspection Technology Survey and Review** - HRSD periodically conducts a review of the technologies available for the inspection of wastewater force mains. The review focuses on new technologies, potential

upcoming technologies, advances in existing technologies, and lessons learned in the application of the technologies in the field. Based on the findings of the review, HRSD's inspection approach is updated, as required. This is particularly important due to the rapid advancement of pressure pipe inspection technologies.

7. **Hydrogen Sulfide (H2S) Monitoring** – HRSD evaluated an H2S monitoring tool and will periodically evaluate other tools as the technology progresses.
8. **External Corrosion Investigation and Mitigation** – HRSD has developed an external corrosion investigation and mitigation program. The key activities included: a comprehensive soil corrosivity survey to identify pipe segments that are located in low resistivity soils, locating stray currents from adjacent utilities or railroads, identified pipe segments with potentially active corrosion cells (e.g. dissimilar metals, etc.), located appurtenances or fittings with vulnerable ferrous materials (e.g. dresser coupling bolts, etc.), evaluated cathodic protection system integrity and anode depletion rates. The program will be used to prioritize condition assessment efforts, cathodic protection system installations, or continuous monitoring procedures.

For additional information on Force Main Maintenance, see Section 2.8 of this plan.

2.5.3.1.2 Gravity Interceptors

The gravity system makes up approximately 10% of the HRSD system in comparison to force mains. CCTV inspections of gravity mains and the associated manholes are performed on a routine basis with a goal of inspecting at least 39,600 linear feet per year. Identified defects are documented and prioritized for remediation based on risk. For additional information on Gravity Interceptors Maintenance, see Section 2.9 of this plan.

2.5.3.1.3 Pump Stations/Pressure Reducing Station (PRS)

HRSD has an ongoing pump station and PRS inspection program using Interceptor Systems and Support Systems staff. Performance data is transmitted through the SCADA system. There are periodic maintenance checks and inspections of the physical, mechanical and electrical systems during routine visits for preventive maintenance (PM) activities. The frequency of inspections and the items that are assessed are defined in the Interceptor Systems Preventive Maintenance Manual (ISPMM) which is periodically reviewed and updated. For additional information on Pump Station Maintenance, see Section 2.7 of this plan.

2.5.3.2 Treatment Facility Systems

A Treatment Plant CAP was developed to assess the condition of above ground assets. A baseline condition assessment was completed at all treatment plants and each asset will be assessed on a three-year cycle. A prioritization of treatment plant buried pipe condition assessment was completed in FY22 and condition assessment performed on critical pipe segments in FY23. Like the interceptor force mains, future pipe condition assessment will be prioritized based on risk.

2.5.4 Training

HRSD personnel performing system routine inspection and preventive maintenance are trained in one of HRSD's apprenticeship programs. As part of these programs, they receive on-the-job training and formal classroom education to become familiar with the unique conditions related to the HRSD systems.
HRSD staff overseeing the CCTV system contract are certified in the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) program.

HRSD personnel that perform Cathodic Protection system inspections and data analysis are certified in the National Association of Corrosion Engineers (NACE) programs.

The ISPMM and Treatment Plant Condition Assessment Procedure are available to the staff to document what specific activities are conducted during inspections.
Procedures on how to perform calibration and maintenance are available to Support Systems staff through CMMS.

2.5.5 Information Management

HRSD has compiled a database of gravity system condition data in a PACP- and MACP-compliant format. and uses a GIS-based risk analysis software to assist with information management. HRSD will continue to populate the database as inspection data is acquired.
Other condition assessment data collected related to the interceptor system CAP, such as pipe wall thickness measurements, acoustic leak detection inspections, air pocket locations, coupon data, and cathodic protection inspections are stored in HRSD's spatial GIS database. The GIS-based risk analysis tool is also used for the Force Main risk analysis based on condition assessment and failure history data.
Information captured during routine inspections/maintenance on assets, specifically facility system assets and pump stations, is captured in HRSD's CMMS.

2.5.6 Resource Management

The Asset Management Department is responsible for the CAP and utilizes HRSD staff and consultant and contractor resources to implement the program. Resources and activities are generally designated as follows:

- Condition Assessment program management support is provided by an engineering consulting firm that also provides utility locating services and material analyses through subcontracts. This firm reports to the Condition Assessment Managers who report to the Director of Asset Management who reports to the Chief Engineer.
- Routine inspection and preventive maintenance of the gravity, force mains and pump station systems are performed by personnel in the North Shore Interceptor Systems Department and South Shore Interceptor Systems Department. These personnel report to the director of each of these departments and these directors report to the Chief Operating Officer. The Infrastructure Assessment Section manages the CCTV inspection contract.
- Treatment facility routine inspection and preventative maintenance is performed by personnel in each of the associated treatment facilities. These personnel ultimately report to the Directors of Treatment who report to the Chief Operating Officer.
- Contractors with access to specialty inspection equipment typically perform inspection of large diameter pipes. Inspection equipment and technologies utilized generally include acoustic, CCTV, sonar, laser, and other accepted methods. These contractors report to the Infrastructure Assessment Section of Support Systems that reports to the Chief Operating Officer.

Refer to Appendix A for identification of staff responsible for the execution of this program.

2.5.7 Process for Continuous Improvement

The following elements have been identified for continuous improvement:

- HRSD developed a CAP for treatment facility yard piping and is currently mapping all treatment plant

pipe segments.

- The ISPMM and Treatment Plant Condition Assessment Procedure will be revisited periodically and updated, as necessary. The preventive maintenance activities defined in the manuals will be incorporated into the CMMS in a phased manner which will allow more efficient work order creation and more timely future revisions.
- HRSD will continue to investigate interceptor failures to determine the conditions that led to the failures, and an annual review of the failures will be conducted to determine if any trends can be seen in the failures.
- HRSD will continue to perform prompt repairs of observed severe defects meeting established risk criteria as they are discovered. If a significant number of repairs build up into a backlog, HRSD will prioritize them based on risk.
- HRSD will continue adding soil sample data to enhance the external corrosion investigation and mitigation program.

2.5.8 Implementation Plan

Program Milestone	Description	Time Frame
Annual Review of Failures	Review failures to identify possible patterns of failure	Annually
Force Main Inspection Technology Survey and Review	Conduct a review of the technologies available for the inspection of wastewater force mains	Periodically
Groundwater Table Survey	Comprehensive groundwater table survey to identify pipe segments that are frequently submerged in groundwater.	Annually
Condition assessment technology review	Evaluate new technologies for possible use	Annually
Treatment Yard Pipe Mapping	Perform a comprehensive inventory of WWTP below ground assets including attribute data, elevation, install date, and replacement cost.	June 2025

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2.6 Contingency Planning

2.6.1 Program Definition and Purpose

HRSD has prepared contingency plans to implement emergency response procedures to certain situations when it is known there is a potential impending problem in the system, or a severe weather event is forecast. When appropriate, these plans are coordinated with the Localities tributary to HRSD, and assistance is provided to the Localities in the development of their contingency plans. Trained crews are available 24 hours a day, seven days a week to respond if needed. Equipment, such as emergency generators and backup pumps, is available in the event of an emergency.

2.6.2 Goals and Performance Measures

The goal of contingency planning is to ensure rapid response and effective emergency operations in the event of abnormal conditions.

Due to the varying circumstances encountered during emergency situations, performance measures are not appropriate for contingency response activities. Depending on the severity of the event, HRSD may review the event to account for unforeseen circumstance, obtain lessons learned and recommendations to ensure continuous improvement. All sanitary sewer overflows (SSOs) are analyzed and categorized with the intention of resolving future failures.

2.6.3 Program Description/Components

Due to the complicated risks faced by and varied components of HRSD's system, the Contingency Planning Program includes several plans written and implemented by different groups of HRSD employees in order to address diverse emergency situations. One of the major components is the SSO Response Plan (SSO RP) which provides structured guidance on addressing and notification of releases. In addition to the SSO RP, the Contingency Planning Program includes the following:

- Water Crossing Contingency and Response Plans (CROPs).
- Pump Station Emergency Contingency Plans.
- Hurricane Readiness and Recovery Plan (HRRP).
- Crisis Communication Plan.
- Scheduled Flow Control Plan; and
- Virginia Water/Wastewater Agency Response Network (VA WARN).

These contingency plan elements are described in more detail in the following sections. Because of the inter-related nature of the system, emergency planning and preparation in one sector or in regard to one plan often supports components of other contingency plans.

2.6.3.1 Sanitary Sewer Overflow Response Plan (SSO RP)

The SSO RP was developed to reduce or prevent environmental and public health impacts of all collection system releases. It provides structured guidance for release response including a range of appropriate and effective field activities that HRSD response teams can choose from to meet the needs of each situation. This document is summarized in Appendix D and is described in further detail in Section 2.1. The SSO RP is updated as required and can be accessed electronically through HRSD's Intranet site and www.hrsd.com.

2.6.3.2 Water Crossing Contingency, Response and Operations Plans (CROPs)

HRSD owns and operates over 100 force and gravity mains that are categorized as water crossings in close proximity of bodies of water. In case of a failure, a discharge could be released directly into the water. To assess and mitigate the risk of failure of these crossings, HRSD evaluated each location to develop priority groups for contingency, response, and operations planning based on likelihood and consequence of failure. These prioritizations were used to divide the crossings into High, Medium, and

Low risk groups. Based on these groups, HRSD has initiated the development of CROPs for the highest risk groups.

Contingency response planning for the assets varies in level of detail and resources necessary depending on the risks associated with potential failure. Required resources may include by-pass pumping plans, a list of contractors if external assistance is needed, and even capital improvement or maintenance projects that may either mitigate the risk of failure or provide redundancy.

2.6.3.3 Pump Station Emergency Contingencies

Operational staff have emergency contingencies in place for pump stations to respond to situations that may arise and crews are available day or night. HRSD maintains a large inventory of portable pumps in various sizes, as well as pipe fittings to repair leaks or breaks. Due to the unique nature of each pump station, contingencies may be different for each location. Each pump station has at least one of the following features for operation during emergencies:

- Dual Power Feeds.
- Emergency Generator.
- Emergency Bypass Pumping Operation.
- Emergency Portable Generators; and
- Emergency Portable Pumps.

2.6.3.4 Hurricane Readiness and Recovery Plan (HRRP)

HRSD is in a hurricane-prone area; therefore, an up-to-date HRRP is maintained and ready for implementation. The plan provides for responses to different levels of hurricane warnings to help prepare the pump stations and other facilities as appropriate to be able to withstand high winds and possible flooding. Each pump station is equipped with an emergency power source or connection for a portable generator facilitating a quick connection when needed. Some stations are equipped with dual power feeds for added reliability. Portable pumps and emergency connections are also available and utilized when needed. Each work center has a plan specific to the facility for operation in the event of a hurricane or a high-water event as a result of storm surge or area-wide flooding.

The HRRP is maintained on HRSD's Intranet site and updated as necessary.

2.6.3.5 Crisis Communication Plan

The HRSD Crisis Management Plan (CMP) provides an overview of the concepts, framework, roles, responsibilities, and escalation protocols in preparing for, responding to, and managing communication through a significant disruptive event or an emerging or existing incident. The CMP defines Communications as one of the 9 critical CMT roles for effective response management.

The primary role of Communications in both the CMP and the CMT is to advise, based on communication expertise. Communications holds an equal role in the CMT, and equal importance in the CMP, as all other roles. Communications will provide communication counsel in all CMT deliberations and will implement stakeholder communication processes approved by the CMT.

This Crisis Communication Plan provides guidance for HRSD communicators as they fulfill their role in both the CMP and the Crisis Management Team (CMT). The following key considerations affect HRSD's ability to effectively communicate with stakeholders in a crisis, while also ensuring effective fulfillment of the Communications role in a response.

2.6.3.6 Agency Notification Plan

When there is an emergency, HRSD notifies DEQ if the result of the emergency has the potential to impact waters of the State. The notification procedures are outlined in SSO RP. DEQ is responsible to notify other parties that may be affected by the issue HRSD is experiencing. The Regulatory Reporting Manual and the SSO RP, both kept internally on HRSD's Intranet site, provide detailed protocol to address tracking and evaluation of releases at the treatment plants. Treatment plant related releases are

manually recorded and reported to DEQ under the VPDES permit.

2.6.3.7 Planned Flow Diversion

Whenever HRSD has a pending construction project or other operational need that has the potential to cause system issues, a flow diversion plan may be developed. In the event flow needs to be diverted, a flow diversion plan is developed, and the appropriate Localities and plant(s) are notified of the temporary changes in the system. Whenever a contractor is performing work on the system, contingency plans are developed to outline emergency procedures if warranted.

2.6.3.8 Virginia Water/Wastewater Agency Response Network

HRSD is a charter member of the Virginia Water/Wastewater Agency Response Network (VA WARN). The purpose of VA WARN is to provide a method whereby water and wastewater utilities that have sustained damages from natural or manmade events could obtain emergency assistance in the form of personnel, equipment, materials, and other associated services as necessary from other water and wastewater utilities before a local, state or federal emergency declaration is issued. The objective is to provide rapid, short-term deployment of emergency services to restore the critical operations of the impacted utility as soon as possible. Utility performance is increased by being able to tap into resources that would not otherwise be available without the WARN network. Being a member of WARN enhances management performance by being proactive and planning for either manmade or natural emergencies.

2.6.4 Training

To facilitate quick response, training for these plans is performed for applicable staff as necessary. HRSD trains Interceptor Systems personnel on emergency repair procedures and equipment, use of portable equipment, trenching and shoring technology and confined space entry procedures. Technicians complete an apprenticeship program, which includes education on various types of preparedness applications.

2.6.5 Information Management

HRSD maintains the latest versions of emergency preparedness documentation on HRSD's Intranet site for company-wide viewing.

2.6.6 Resource Management

The overall lead for the Contingency Planning Program is the Chief Operating Officer. However, all HRSD staff members may be available for response to emergency situations based on their unique responsibilities. HRSD assigns and communicates to the staff members who are keepers of the various contingency plans, and those assignments are adjusted depending on workloads of the staff.

Depending on the situation, emergency bypass pumping may be operated by HRSD staff or by an outside contractor who specializes in this service. HRSD has a wide variety of pump types and sizes available to set up a bypass pumping operation. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

2.6.7 Process for Continuous Improvement

After each serious emergency event, HRSD evaluates the response and the results of the crew's activities to adjust the contingencies to continuously improve the procedures. HRSD will continue to develop CROPs for high-risk water crossings as needed.

2.6.8 Implementation Plan

None at this time.

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2.7 Pump Stations

2.7.1 Program Definition and Purpose

The Interceptor Systems Department – North Shore and South Shore – are responsible for operating and maintains more than 500 miles of pipelines and 89 pump stations in the systems covered by this MOM document that convey wastewater from the Locality-operated collection systems to HRSD treatment plants. As of June 2024, the 89 pump stations are comprised of wet well stations and Pressure Reducing Stations (PRS), including stations under construction, and supplemented with or bypassed completely with portable pumps.

The Department provides day-to-day monitoring and response to problems to minimize or prevent leaks and overflows. The Department also provides preventive maintenance (PM), interceptor inspections, replacements, and renovations. This program element focuses on operations and maintenance of pump stations including the PRSs.

2.7.2 Goals and Performance Measures

The goals of the Pump Station Maintenance Program are:

- Provide reliable continuous service and maintain compliance with federal and state regulations.
- Maintain pump stations to minimize operational problems and maximize the useful life of the pumps; and
- Inspect, maintain, and lubricate pumps and other equipment according to sound maintenance principles.

Goals		Performance Measures	Target Value
Pump Station Annual PMs	Maintain the pump stations to protect the public safety, to protect the environment, reduce SSOs and to achieve the maximum service life from the pump stations	All active pump stations are to receive the Annual Inspection as described in the ISPMM.	100% (≥81 pump stations per year)
Pump Station Annual PMs	Maintain the pump station electrical equipment to protect public safety, to protect the environment, reduce SSOs and to achieve the maximum service life from the pump stations.	All active pump stations are to receive the Annual Electrical PM as described in the ISPMM.	100% (≥81 pump stations per year)
Annual PM for Backup Generators	Preventive maintenance is performed on the emergency generators to protect the safety of the public, the environment is protected and SSOs reduced when electrical power to the pump motors from the public utility has been disrupted.	All backup generators are to receive an annual preventive maintenance.	100% (≥55 generators to receive PM per year)
Pump Station Inspections	Maintain the pump stations to ensure the public safety, to protect the environment, and to achieve the maximum service life from the pump stations	All active pump stations are to be visited and inspected monthly using the checklist in the Pump Station Monthly Report in the ISPMM. These inspections are to occur on a nominal 1 time per month basis. Wet wells will be cleaned at least annually on an as needed basis. (No. of Monthly inspections performed per month / No. of pump stations) x 100%	98%

Goals		Performance Measures	Target Value
Pump Station Safety Inspections	Ensure proper condition and safety of equipment within pump stations to prevent injury to personnel.	Safety Inspections of each pump station are to be performed semi-annually in conjunction with the Safety Section following the procedures in the Safety SOP and ISPMM (No. of pump station safety inspections performed / No. of pump stations x 2) x 100%	100%
Pump Stations - Infrared Scan	Infrared scan of electrical components is performed annually to locate any loose electrical connections or other incipient electrical failures that produce a heat signature.	Perform Infrared Scan annually. (No. of Pump Station Scanned in past 2 years / No. of Pump Stations) x 100%	100%

Note: The values shown in red text are the measures that are explicitly identified in the Consent Decree and that have associated stipulated penalties. The target values shown are at or above these Consent Decree levels. Where the target value is above the Consent Decree level, HRSD has selected a higher level of performance.

2.7.3 Program Description/Components

HRSD operates 70 wet well-type pump stations and 19 pressure reducing stations in the Metro area. Maintenance for each pump station or PRS is performed by technicians under the supervision of Pump Station Supervisors. Operation logs are maintained at all pump stations that list the activities of both routine and problem response of the crews. Preventative maintenance is scheduled and documented in CMMS. Pump stations are equipped with SCADA systems and alarms to alert operators to problems so they can take appropriate action.

HRSD utilizes various methods for redundancy in supplying power to its pumping facilities. These methods include diesel-driven pumps, portable generators, back-up generators with automatic transfer switch, and dual-feed power supply. Permanently installed back-up generators or bypass pumps are located at 100 percent of the pump stations on the North Shore and 92 percent of the pump stations on the South Shore. There are three portable generators stored at the South Shore Maintenance Shop located at 1436 Air Rail Avenue, Virginia Beach, VA 23455, and two portable generators stored at the North Shore Maintenance Shop located at 2389 G Avenue, Newport News, VA 23602.

Many pump stations are run with variable speed controllers to maintain relatively constant liquid levels in the pump station wet wells. The liquid level is maintained at an elevation that minimizes the free fall distance of the wastewater as it enters the wet well. The shorter free fall distance helps to reduce air entrainment in the wastewater and to reduce splashing and turbulence in the wet well, thereby reducing the release of hydrogen sulfide. The reduction in air entrainment also reduces the amount of air and hydrogen sulfide released in the force main. The reduction of air and hydrogen sulfide release helps to maintain system capacity, slow down the corrosion process and helps to reduce odor problems at pump stations and downstream facilities.

HRSD deploys temporary and/or interim pumping equipment as needed to assist targeted portions of the interceptor system for limited durations. These facilities typically consist of portable pumps powered by fuel or power source and connected to piping which runs from the pump connection to an HRSD pipeline.

Examples are bypass pumps for situations when a pumping facility is out of service and interim pressure reducing pumps to provide interim pressure reduction prior to solutions developed in the Integrated Plan. Such installations are not provided with permanent support services, such as permanent electrical feeds, and can be quickly decoupled from the system when no longer needed. For each installation, HRSD chooses

whether to install and maintain the equipment using in-house resources only, to procure it through contract with a service provider (lease or rent) or as part of a capital improvement construction project. For contracted and construction related installations, the ongoing maintenance of the temporary or interim equipment is typically a requirement of the relevant contract vehicle (construction contractor or rental company). North Shore and South Shore have installed technology that monitors a pump motor's amperage. When a rag gets wrapped in the pump impeller thus increasing the amperage, the technology reverses the pump for a few short seconds which, in turn, dislodges the rag. It then allows the pump to go back to normal operation which passes the rag through. The technology has decreased the manhours of physically de-ragging the pump. Similarly, HRSD has also created a de-rag function block within the new SCADA system to perform de-ragging operations on a time-based programming interval. This system enhancement has also led to improved pump station performance.

2.7.3.1 Preventative Maintenance

The Interceptor Systems Preventative Maintenance Manual (ISPMM) was updated June 2023 to include current checklists and inspection frequencies. Procedures will continue to be reviewed and changed based on operational experience or process changes. The ISPMM is kept internally on HRSD's Intranet site.

HRSD pump station crews have a goal to check active pump stations daily. A checklist is followed to examine the condition and operations of the pump station to make sure it is working properly. Fuel tanks are inspected to confirm they are in adequate condition. Crews test batteries, alarms, run emergency generators, and perform checks on the supervisory system to confirm they are in adequate condition. Records of pump curves and alarms are maintained on HRSD's business network.

Wet wells are inspected as part of the weekly inspections and are pumped down and cleaned, at least annually, as part of the annual preventive maintenance. Pump station crews use data visualization tools to check pressures within pipes, monitor SCADA information (which includes pressure settings from pump stations), and monitor flow meters, pump pressures, temperature monitoring, etc.

A list of stations with permanently installed emergency generators or diesel bypass pumps to meet Class 1 Reliability is included as Table 2-2. On a monthly basis, preventive maintenance, inspection, and test runs are performed on the emergency generators and diesel bypass pumps per the ISPMM. A copy of these forms and the schedule of these services are listed in the ISPMM.

Table 2-2. List of Stations with Class 1 Reliability			
Station	**Shore**	**Diesel Bypass Pump**	**Generator Set**
25th Street PS	North Shore		x
33rd Street PS	North Shore		x
Bay Shore PS	North Shore		x
Big Bethel PRS	North Shore		x
Bloxoms Corner PS	North Shore		x
Bridge Street PS	North Shore		x
Claremont Avenue PS	North Shore		x
Coliseum PRS	North Shore		x
Colonial Williamsburg PS	North Shore		x
Copeland Park PS	North Shore		x
Ferguson Park PS	North Shore		x
Ford's Colony PS	North Shore		x
Fort Eustis PS	North Shore		x
Freeman Drive PS	North Shore		x
Greensprings PS	North Shore		x
Hampton University PS	North Shore		x
Hardy Elementary School PS	South Shore		x
Hilton School PS	North Shore		x
Jefferson Ave. PS	North Shore		x (BHTP)
Kingsmill PS	North Shore		x
Langley Circle PS	North Shore		x
Lodge Road - Natural Gas Engine	North Shore		x
Lucas Creek PS	North Shore		x
Morrison PS	North Shore		x
Newmarket PS	North Shore		x
Normandy Lane PS	North Shore		x
North Avenue PS	North Shore		x
Patrick Henry PS	North Shore		x
Rolling Hills PS	North Shore		x
Route 199 Interim PRS	North Shore	x	
Smithfield Interim PRS	North Shore	x	
Triton Court PS	North Shore		x
Victoria Boulevard PS	North Shore		x
Washington Street PS	North Shore		x
Willard Avenue PS	North Shore		x
Williamsburg PS	North Shore		x
Woodland Road PS	North Shore		x

Table 2-2. List of Stations with Class 1 Reliability (cont)			
Station	**Shore**	**Diesel Bypass Pump**	**Generator Set**
Arctic Avenue PS	South Shore	x	
Ashland Circle PS	South Shore	x	
Atlantic PRS	South Shore		x
Bainbridge Boulevard PS	South Shore		x
Bowers Hill PRS	South Shore		x
Camden Avenue PS	South Shore		x
Cedar Lane PS	South Shore		x
Chesapeake Boulevard PS	South Shore		x
City Park PS	South Shore	x	
Colley Avenue PS	South Shore	x	x
Courthouse PRS	South Shore	x	x
Deep Creek PRS	South Shore		x
Dovercourt PS	South Shore		x
Doziers Corner PS	South Shore	x	
Elbow Road PRS	South Shore	x	x
Elmhurst Lane PS	South Shore		x
Ferebee Avenue PS	South Shore		x
Granby St PS	South Shore	x	
Independence Boulevard PS	South Shore		x
Kempsville Road PRS	South Shore		x
Laskin Road PRS	South Shore		x
Monroe Place PS	South Shore	x	
Newtown Road PS	South Shore		x
Norchester Avenue PS	South Shore	x	
North Shore Road PS	South Shore		x
Norview Avenue PS	South Shore		x
Park Avenue PS	South Shore	x	x
Pine Tree PRS	South Shore		x
Plume Street PS	South Shore		x
Powhatan Avenue PS	South Shore	x	
Providence Road Off-line Storage Facility Drain PS	South Shore		x
Providence Road PRS	South Shore		x
Pughsville PRS	South Shore		x
Quail Ave PRS	South Shore		x
Quail Avenue PS	South Shore	x	x
Richmond Crescent PS	South Shore	x	x

Table 2-2. List of Stations with Class 1 Reliability (cont)			
Station	**Shore**	**Diesel Bypass Pump**	**Generator Set**
Robin Hood Road PS	South Shore	x	
Rodman Avenue PS	South Shore	x	x
Route 337 PRS	South Shore		x
Seay Avenue PS	South Shore	x	
Shipps Corner PRS	South Shore		x
State Street PS	South Shore		x
Steamboat Creek PS	South Shore		x
Suffolk PS	South Shore	x	x
Taussig Blvd PS	South Shore		x
Terminal Boulevard PS	South Shore		x
Virginia Beach Boulevard PS	South Shore		x
Washington District PS	South Shore	x	
Willoughby Avenue PS	South Shore	x	

Note: Jefferson Ave. PS receives its primary and secondary power from the Boat Harbor Treatment Plant.

2.7.3.2 Electrical and Instrumentation

HRSD's E&I maintain the electrical and instrumentation equipment at all pump stations. Electrical maintenance procedures have been incorporated into the CMMS program. Infrared scan of electrical components is performed annually to locate any loose electrical connections or other incipient electrical failures that produce a heat signature.

2.7.3.3 Mechanical

Interceptor Systems Department pump station crews do most of the mechanical maintenance of pump stations, assisted by the Machine Shops for repairs and by Automotive Shops for emergency generator maintenance.

2.7.3.4 Structural

Interceptors Department pump station crews perform only minor structural maintenance. Minor structural and roof work at pump stations is the responsibility of the Support Systems Department. Major structural and rehabilitation, such as wet well rehabilitation that requires contractors, is often incorporated into the CIP.

2.7.3.5 Corrective Maintenance

The pump station crews notify supervisors when corrective maintenance is needed, and the supervisors assign repair crews to perform the corrective work. Minor repairs are performed by pump station crews and more involved corrective maintenance is performed by repair crews.

HRSD pump stations are designed to have the flexibility to operate under different scenarios. HRSD can operate them either automatically or manually if necessary. HRSD has limited capability to redirect the flow in different directions in some locations in the system, utilizing different valving configurations and pump stations. Redirection of flow is done to facilitate maintenance and for emergency purposes. Interceptor Systems supervisors are aware of how the system is valved so they can respond in a timely manner in the event that direction of flows needs to be changed.

When complaints are received, or an alarm condition exists in the SCADA system, crews are dispatched to

investigate and resolve the problem. HRSD employees are always on call for emergency response outside of normal business hours.

2.7.4 Training

HRSD employees that are responsible for operations and maintenance of pump stations or pressure reducing stations complete HRSD's Apprenticeship Program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis.

2.7.5 Information Management

Operation logs that list the activities of both routine and corrective response of the crews are maintained at all pump stations. Interceptor crew preventative and corrective maintenance as well as work performed by the Support Systems Department and E&I are scheduled and documented in a CMMS. Pump stations are equipped with SCADA systems and alarms to alert operators to problems so they can take appropriate action.

Records of pump curves and alarms are currently maintained and made available. Records for preventative maintenance are kept as a record of the activities conducted by the crews.

2.7.6 Resource Management

The pump stations are operated and maintained under the direction of the Interceptor Systems Directors who report to the Chief Operating Officer.

Maintenance for each pump station is performed by Interceptor Department Systems operators under the supervision of pump station supervisors. The Interceptor Systems repair crews perform heavy and intermediate pump station and interceptor maintenance repairs and projects. This group has the heavy equipment and resources to make repairs to the pump stations, force mains and gravity lines. A spare parts inventory is maintained that consists of pipe parts and pump parts necessary to keep the system operating. Emergency contingency plans are in place to react to situations that may arise, and crews are available to respond day or night.

HRSD's E&I Department's staff maintain the electrical and instrumentation equipment at all pump stations. The Support Systems Department's Automotive Shop personnel perform preventive maintenance work on the portable emergency generators, and the Machine Shop personnel perform major rebuilds on pumps and miscellaneous equipment.

Interceptor Systems Pump Station Crews perform only minor structural maintenance. Minor structural and roof work at pump stations is the responsibility of the Support Systems Department. Major structural repairs and rehabilitation, such as wet well rehabilitation that requires contractors, are often incorporated into the CIP.

Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

Tables B-1 and B-2 in Appendix B detail how North Shore and South Interceptor Systems Departments assign human and equipment resources to critical MOM components related to pump stations.

2.7.7 Process for Continuous Improvement

HRSD's ISPMM was updated in June 2023. This update reflects revised PM checklists, forms, and schedules. Subsequent reviews will reflect additions or deletions of equipment and revised PM procedures. The manual is reviewed every three years to determine if additional revisions are needed. Basic information regarding PM intervals and descriptions from the manual will be gradually incorporated into the CMMS which will allow more efficient work order creation and more timely future revisions.

HRSD is continuing to implement the CMMS to allow more widespread usage. Equipment records will

contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and maintenance activities. The reporting information obtained from the CMMS will allow evaluation of the effectiveness of individual PM procedures on individual equipment and moreover of the entire MOM Program. HRSD has established standards to allow the criticality of assets to be determined. The relative criticality of equipment will allow efficient allocation of resources to the most critical assets.

In 2016, HRSD incorporated Pump Station beautification into the Pump Station Design Guidelines which can be referenced in the HRSD Design and Construction Standards to address both new and renovated pump stations.

The Guidelines are intended to direct the aesthetic design of support facilities. Facility design should strive to achieve the following principles:

- Overall site and building design should respect the community in which the facility is located.
- Architecture should blend into the local context of the site and community where feasible. If the project site is remote or industrial, the aesthetic may be more utilitarian. A more urban or developed location requires more attention to the architectural style and composition.
- Building façade should show quality detailing and finely tuned proportions.
- Materials should be selected for durability and low maintenance.
- Building design should balance aesthetic form and operational function. Functionality drives the design of the facilities, but design can properly address unique conditions.

2.7.8 Implementation Plan

Program Milestone	Description	Time Frame
Review and, if necessary, revise ISPMM	Revise June 2023 manual to show latest procedures and correct schedules. The ISPMM should be a living document that reflects changes in equipment and knowledge.	Every 3 Years
Vibration Monitoring	Install vibration sensors for critical assets at pump stations in a phased manner after a pilot program in FY25	6/30/2027
Generator and Transfer Switch Assessment	Assess the condition of exiting generators and automatic transfer switches to ensure the reliability of electrical power at pump stations after a pilot program in FY25	6/30/2027

2.8 Force Main Maintenance

2.8.1 Program Definition and Purpose

HRSD maintains more than 500 miles of pipeline, of which approximately 90 percent is pressurized pipe (force mains). The North Shore and South Shore Interceptor Systems Departments operate and maintain the force main system.

2.8.2 Goals and Performance Measures

The goals of the Force Main Maintenance program are to:

- Provide reliable continuous service and maintain compliance with federal and state regulations.
- Maintain the force main system to minimize failures and impacts to the surrounding communities.
- Preserve the useful life of the force main system.

Goals		Performance Measures	Target Value
Non-Invasive FM Inspection Near Drinking Water Reservoirs	Inspect Force Mains Near Reservoirs within 2,500 feet of a drinking water supply reservoir to Identify Conditions that may lead to Problems Prior to Failure	Perform noninvasive inspection of FMs within 2,500 feet of a drinking water supply to identify air pockets and leaks. (No. of linear feet of FM inspected per year)	17% annually (2,400 linear feet inspected per year)
Force Main PM - Air Venting	Force mains must periodically have air and gases vented to prevent loss of efficiency of pump stations and to reduce corrosion of piping due to hydrogen sulfide gas.	Perform air release valve PM, No. of PMs per year	1550 ARVs vented per year
Force Main PM	Force mains must be checked periodically for hidden leaks, have air and gases vented, checked for structural damage at exposed pipe crossings, etc. to prevent loss of efficiency of pump stations and to reduce corrosion of piping due to hydrogen sulfide gas, etc.	Perform Force Main annual PM per Force Main Inspection Procedures in the ISPMM. [(No. of times Force Main PMs are performed)/ (No. of FM annual PMs)] X 100%	100%
FM Pressure Control Valve Inspections	Pressure control valves maintain desired FM pressures upstream of the control valve to allow proper system control, and these devices must be inspected periodically.	FM Pressure control valves are to be inspected annually following the procedures in the Pressure Control Valves section of the ISPMM. [(No. of pressure control valve vaults inspected per year) / (total No. of pressure control valves)] X 100%	100%
Cathodic Protection	Cathodic Protection Systems reduce the rate of corrosion of the FM piping system by being consumed instead of the pipe material. They must be inspected and replaced as needed.	The Cathodic protection systems in the FM system are to be inspected 1 time every 2 years following the procedures in the Cathodic Protection section of the ISPMM. [(No. of Cathodic Protections Systems inspected every 2 years / Total No. of Cathodic Protection Systems in the system)] X 100%	100%

Note: The values shown in red text are the measures that are explicitly identified in the Consent Decree and that have associated stipulated penalties. The target values shown are at or above these Consent Decree levels. Where the target value is above the Consent Decree level, HRSD has selected a higher level of performance.

2.8.3 Program Description / Components

HRSD's system is primarily comprised of force mains. Flow is collected from Localities, private systems, and industries via numerous connection points to HRSD force mains.

2.8.3.1 Preventive Maintenance

Preventive maintenance activities on force mains include monitoring of cathodic protection, venting, exercising, and inspecting valves, clearing right of ways, inspecting exposed crossings, casting adjustments, and marking appurtenances. Routine venting of gas at established locations is a regular maintenance activity that both improves operations and reduces the potential for buildup of corrosive gases. Venting frequency is based on field conditions and specific experience at that location.

Force main checklists and inspection schedules are available in the ISPMM that is kept internally on HRSD's Intranet site. Procedures are reviewed and changed based on operational experience or process changes.

In addition, HRSD is investigating technologies, such as acoustic monitoring and intelligent pigging, which may allow for the internal inspection of force mains without taking them out of service. HRSD evaluates the use of various technologies for force main inspection as part of the ongoing MOM Program.

2.8.3.2 Valves

Isolation valves on force mains are exercised periodically with a goal of semi-annual exercise for all critical valves. All valves are exercised as part of the force main annual PM. When exercising the valves, interceptor crews report valves that need to be repaired and schedule those valves for routine or more extensive maintenance as required. The total number of turns it takes to exercise a valve is recorded.

Air release valves are operated a minimum of once a year and more frequently as needed to release air/gases from the force mains. Air release valves that show signs of corrosion are replaced to eliminate the possibility of a failure that could result in a sanitary sewer overflow.

2.8.3.3 Corrosion Control

Corrosion control includes measures for corrosion prevention and monitoring for the pressure pipelines. Control measures for HRSD's force mains consist of cathodic protection, air entrainment considerations, and external ultrasonic wall thickness testing. In addition, all newly constructed pipelines are of inert materials or have internal lining that is corrosion resistant.

2.8.3.4 Cathodic Protection

Cathodic Protection is a technique used to protect metal structures from corrosion and is used to protect buried metallic pipelines susceptible to corrosion in HRSD's system. Sacrificial Anode and Impressed Current are two methods of providing cathodic protection to the pipes. Section V.B.5 of the Design and Construction Standards requires an evaluation for the need for cathodic protection based on soil conditions and stray currents from other utilities.

2.8.3.4.1 Impressed Current Cathodic Protection

Impressed Current Cathodic Protection system uses anodes connected to a power source. The system provides an electrical path from the anode array to the cathode (pipeline). The anodes corrode, reducing the corrosive reaction in the pipeline. HRSD inspects the cathodic protection systems (both impressed current and galvanic) at a minimum bi-annually, either by trained internal staff or contracted labor. Issues identified during inspections are corrected, as recommended.

2.8.3.4.2 Sacrificial Anode Systems

The sacrificial anode systems are very similar to the impressed current systems except that sacrificial galvanic anode systems do not use a rectifier to drive the current from the anode to the pipe. The galvanic anode corrodes, consuming the anode material until it must be replaced. The current generated by the dissimilar metals flows from the anode to the cathode (pipeline).

HRSD monitors the condition of the sacrificial anodes, analyzes the results and HRSD technicians execute any needed service or replacements. When necessary, additional testing is conducted by a National Association of Corrosion Engineers-certified Corrosion Technician.

2.8.3.4.3 Non-Destructive Wall Thickness Testing

Non-destructive thickness testing characterizes material thickness, integrity, or other physical properties by means of high-frequency-sound waves used in ultrasonic testing (UST) for ferrous material, high frequency radio waves used in Pipe Penetrating Radar (PPR) for reinforced cementitious material without a ferrous cylinder, and low-frequency stress waves used in Impact Echo for cementitious material that contains a ferrous cylinder such as PCCP. In thickness testing, ultrasonic techniques permit quick and reliable measurement of pipe wall thickness without requiring access to both sides of the pipe. Thickness can be measured on cementitious and metal pipe only.

HRSD conducts ultrasonic pipeline thickness testing and visual inspection when opportunities present themselves. These opportunities include but are not limited to when a pipe is exposed for maintenance or repair and if a condition problem is suspected at a specific point. Measure of wall thickness can be used to monitor for corrosion.

2.8.3.4.4 Corrective Maintenance

When a force main fails, HRSD responds with the appropriate equipment and parts to make the necessary repairs. To minimize the potential of a spill of sewage to the environment, bypass pumping or flow diversion may be needed to isolate the location to be repaired.

If sewage is released, HRSD staff members follow the procedures outlined in the SSO RP.

2.8.4 Training

HRSD employees that are responsible for operations and maintenance of pump stations or pressure reducing stations complete HRSD's Apprenticeship Program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis.

2.8.5 Information Management

HRSD has a CMMS that records and keeps track of maintenance records to assist staff in identifying what actions need to be taken in response to problems, identifying normal maintenance, and scheduling needed maintenance. HRSD manages inventories through CMMS.
GIS is also used to manage information about interceptor force mains and field data collection. Record drawing information is managed in the Engineering Document Management System. Both sources are maintained on HRSD servers.

2.8.6 Resource Management

The HRSD force main system is operated and maintained under the direction of the Directors of Interceptor Operations. These directors report to the Chief Operating Officer.

Tables B-1 and B-2 in Appendix B detail how each component of the Interceptor Systems Department's human and equipment resources are assigned to critical MOM components related to force mains.

2.8.7 Process for Continuous Improvement

HRSD updates the ISPMM at least every three years. This update reflects updates to inspection checklists, forms, and schedules. Ongoing reviews will incorporate additions or deletions of equipment, revised PM procedures, and any revised PM schedules. The manual is reviewed every three years to determine if additional revisions are needed. Information from the manual has been incorporated into the CMMS which allows more efficient work order creation and more timely future revisions. Equipment records will contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and

maintenance activities. The updated Preventive Maintenance procedures and schedules from the updated ISPMM are incorporated in the CMMS. The reporting information obtained from the CMMS will allow evaluation of the effectiveness individual PM procedures on individual equipment and moreover of the entire MOM Program. HRSD is continuing to develop standards to allow the criticality of assets to be determined. The relative criticality of equipment will enhance the decisions made to properly maintain a large system without consuming excessive resources.

HRSD staff attend inspection-related conferences and maintain continual communication with vendors on a consistent basis to stay abreast of the latest inspection technologies and processes.

2.8.8 Implementation Plan

Program Milestone	Description	Time Frame
Issue updated version of PM Manual	Revise June 2023 manual to show latest procedures and correct schedules. The PM Manual should be a living document that reflects changes in equipment and knowledge.	Every 3 years
Unvented High Point Analysis	Re-evaluate the force main system to identify unvented high points using record drawing review and other methods.	By 2027

2.9 Gravity System

2.9.1 Program Definition and Purpose

HRSD operates a gravity sewer system, performs routine maintenance and cleaning, assesses the condition of the system, and performs corrective maintenance when required to keep the system running in an effective and safe manner.

2.9.2 Goals and Performance Measures

The goals of the Gravity System Maintenance program are to:

- Provide reliable continuous service and maintain compliance with federal and state regulations.
- Maintain the gravity system to minimize impacts to the surrounding communities.
- Preserve the useful life of the gravity system.

Goals		Performance Measures	Target Value
Gravity System CCTV Inspections	Internal inspection of the Gravity System lines provides useful information to assess the condition of the lines allowing proactive measures to be taken to reduce infiltration and identify conditions that may lead to failure.	Perform internal inspection of HRSD gravity sewers, linear feet inspected per year	17% annually (39,600 linear feet inspected per year)
Gravity Sewer Cleaning	Obstructions in HRSD Gravity Sewer systems are a primary cause of SSOs in these systems, and the systematic cleaning of the system is necessary to remove debris and accumulations of solids from all sources and reduce SSOs.	Perform cleaning of HRSD gravity sewers to remove debris. Linear feet cleaned per year	17% annually (26,400 linear feet cleaned per year)
Manholes	The integrity of manhole structures is important to contain sewerage, to allow safe maintenance access, and to avoid obstructions caused by failed manhole materials.	All HRSD manholes will be opened and visually inspected within a 6-year time span using the Manhole and Field Inspection Report form in the ISPMM. [(No. of manholes inspected per year) / (Total number of manholes /)] x 100%	17% annually
Exposed Pipe Crossings	Exposed sections of gravity main supported by bents, cradles, hangers, etc. are more subject to external pipe damage and must be inspected periodically.	All exposed pipe locations are to be inspected annually as described in the Exposed Pipe Crossings section in the ISPMM. [(No. of exposed locations inspected per year) / (Total No. of exposed locations)] x 100%	100%
Siphon Chambers	Properly maintained siphon chambers allow siphons to perform properly	The HRSD Siphon Chambers are to be visually inspected within a 6-year time span using the following the procedures in the Siphon Chambers section of the ISPMM. (No of Siphon Chambers inspected per year / Total number of Siphon Chambers) X 100%	100%

Note: The values shown in red text are the measures that are explicitly identified in the Consent Decree and that have associated stipulated penalties. The target values shown are at or above these Consent Decree levels. Where the target value is above the Consent Decree level, HRSD has selected a higher level of performance.

2.9.3 Program Description / Components

HRSD owns more than 500 miles of pipeline, of which approximately 10 percent are gravity lines. The condition of HRSD's gravity collection system facilities is assessed, and upgrades are recommended as necessary. The North and South Shore Interceptor Departments provide operations and maintenance of the gravity system.

2.9.3.1 Preventive Maintenance

The collection systems and the portion of laterals in the public right of way serving residents and businesses are owned and maintained by the Localities. These local collection lines discharge to HRSD's lines which are larger and generally do not experience the same problems as the smaller residential lines. For instance, Fats, Oils and Grease (FOG) accumulation and root intrusion are more of a problem for the Localities' smaller diameter lines than with HRSD's larger lines.

Preventive Maintenance activities are conducted on the gravity system and appurtenances on a proactive basis to identify and resolve problems before they result in failures that can cause overflows. Preventive maintenance schedules are defined based on past system performance and experience.
The Interceptors gravity system inspection schedule is available in the ISPMM. Procedures are reviewed and changed based on operational experience or process changes.

2.9.3.2 Closed Circuit Television (CCTV) Inspection

As part of enhancing the integrity of HRSD's network of gravity mains, CCTV is used to inspect HRSD gravity pipelines. HRSD staff overseeing the CCTV system contract are certified in the NASSCO program and use the appropriate rating system to identify the severity of the defects found during the inspection process. The appropriate defect coding provides a level of consistency in the defect rating; therefore, HRSD and others reviewing the inspection records can understand and use the information accordingly.
CCTV inspection is a non-destructive, proactive approach to evaluate the HRSD pipeline infrastructure and is used when observed data is necessary to assess the condition of the pipeline interior. A CCTV inspection may be utilized to:

- Inspect pipeline condition and to determine the location of problem areas such as pipe or joint separations, drops, ruptures, obstructions, deterioration, pipe misalignment, and root intrusions.
- Locate infiltration and inflow sources.
- Look for damage to sewers caused by excavation and construction.
- Search for unrecorded connections, such as illegal or unauthorized tap-ins.
- Evaluate effectiveness of pipeline repairs, replacement, and/or rehabilitation within the sewer system.
- Assess pipeline condition of new installation before the warranty period ends.

The CCTV program has a goal of inspecting 17% of gravity pipelines on a six-year cycle. However, this goal is adjusted according to the condition of the pipe. Pipes that have been inspected and found to be in good condition or pipes that have recently been lined do not require re-inspection as frequently. Conversely, pipes that are found to have some defects but do not yet require immediate rehabilitation are inspected more frequently. CCTV inspection reports and videos are generated after each evaluation and stored on the data server. Along with reports and inspection videos, an updated record on the progress of the normal inspection schedule is kept. An up-to-date copy of CCTV inspection status spreadsheet is located on the HRSD network.

HRSD identifies portions of the gravity system that may be more subject to problems such as inverted siphons, known reverse grades, and known conditional issues. These areas are listed for inspection more frequently than once every six years.

2.9.3.3 Routine Cleaning

HRSD owns combination sewer trucks that are used for system cleaning. These trucks are fitted with the combination of high velocity flushing and vacuum equipment. Cleaning is also done by contract.
Approximately 17% of the gravity system is scheduled to be proactively cleaned each year. If recurring

problem areas are identified, they are cleaned on a more frequent basis. Pump station wet wells are cleaned on a regular basis to avoid blockages and minimize wear and tear on the equipment.

2.9.3.4 Root Control Program

Due to the relatively large diameter of the HRSD pipes, root intrusion is not typically a major problem. CCTV inspection may be utilized to assess the condition of the pipes and determine the location of any root intrusion. If roots are found in the system and have the potential to cause an obstruction to the flow, specialized equipment or chemical applications are employed, where appropriate.

2.9.3.5 Manhole Preventative Maintenance

For manholes owned and maintained by HRSD, there is a proactive inspection program, with a goal to inspect 17% of the manholes each year. As structural problems are found or if significant I/I is seen entering through the manholes, rehabilitation is scheduled based on the severity of the defect.

HRSD installs watertight manholes in areas subject to flooding to minimize the amount of I/I entering the manhole through the lid. Level meters and flow meters may be installed in some manholes to determine the amount of flow in the pipe and to monitor surcharge of manholes which may eventually result in overflows.

2.9.3.6 Corrective Maintenance

Corrective maintenance is needed when an unanticipated problem occurs in the system as a result of blockage, construction activities or an act of vandalism. The same equipment and techniques used in the preventive maintenance activities are employed for corrective maintenance. If the problem results in a release from the collection system, the crews follow the steps outlined in the SSO Response Plan. The locations of overflows are recorded in the GIS system to document cause and pattern of failures that may require additional investigation and preventive maintenance activities.

The Interceptor Departments submit requests to the HRSD Capital Improvement Program based on known problems, equipment obsolescence, or improvement opportunities. These requests are analyzed using an established set of criteria to establish the relative priority of each proposed item.

2.9.3.7 Response to Complaints

Typically, complaints are made to the Operations Coordinator and are forwarded to the appropriate supervisor. These supervisors respond, either during normal work hours or after hours. HRSD maintains a nighttime and weekend answering service that records complaints and forwards them to the supervisor on duty. Complaints are responded to promptly by an on-call staff member. These on-call employees, located on the north and south shores, respond quickly to let the caller know what action is being taken. Standby crews are available 24 hours a day on both shores to respond to any problem requiring additional maintenance action. Other crews can be called in if required or private contractors can be utilized. Activities associated with the response are recorded in the CMMS system.

2.9.4 Training

HRSD employees that are responsible for operations and maintenance complete HRSD's Apprenticeship Program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis. HRSD staff overseeing the CCTV system contract are certified in the NASSCO program.

2.9.5 Information Management

HRSD has a CMMS that records and keeps track of maintenance records to assist staff in identifying what actions were taken in response to problems, identifying normal maintenance, and scheduling needed maintenance. HRSD manages inventories through CMMS.

CCTV inspection reports and videos are generated after each evaluation. Reports are filed by line number and

reference the appropriate electronic file. Along with reports and inspection videos, an updated record on the progress of the normal inspection schedule is kept. CCTV data is analyzed within a GIS database.

2.9.6 Resource Management

The gravity system is operated and maintained under the direction of the two Directors of Interceptor Operations who report to the Chief Operating Officer. The Support Systems Department oversees the CCTV inspections and reports to the Chief Operating Officer.

The Interceptors Systems maintenance crews perform the heavy pump station and interceptor maintenance repairs and projects. This group has the heavy equipment and resources to make repairs to the pump stations, force mains and gravity lines. A spare parts inventory is maintained that consists of pipe parts and pump parts necessary to keep the system operating.

HRSD has added the capability to perform 360-degree, high-resolution inspections of manholes to their arsenal of inspection equipment.

Tables B-1 and B-2 in Appendix B detail how each Interceptor Systems Department's human and equipment resources are assigned to critical MOM components related to gravity system.

2.9.7 Process for Continuous Improvement

HRSD's ISPMM was updated in June 2023. This update reflects revised PM checklists, forms, and schedules. Subsequent reviews will reflect additions or deletions of equipment and revised PM procedures. The manual is reviewed every 3 years to determine if additional revisions are needed. Information from the manual will be gradually incorporated into the CMMS which will allow more efficient work order creation and more timely future revisions. Equipment records will contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and maintenance activities. The updated Preventive Maintenance procedures and schedules from the updated ISPMM are incorporated into the CMMS. The reporting information obtained from the CMMS will allow evaluation of the effectiveness individual PM procedures on individual equipment and moreover of the entire MOM Program. HRSD is continuing to establish standards to allow the criticality of assets to be determined. The relative criticality of equipment will enhance the decisions made to properly maintain a large system without consuming excessive resources.

2.9.8 Implementation Plan

Program Milestone	Description	Time Frame
Issue updated version of PM Manual	Revise June 2023 manual to show latest procedures and correct schedules. The PM Manual should be a living document that reflects changes in equipment and knowledge.	Every 3 years

2.10 Maintenance of Right of Ways and Easements

2.10.1 Program Definition and Purpose

Proactive maintenance of right-of-way (ROWs) and easements minimizes delays when operations and maintenance crews need to access sewer system assets for inspection or repair. Maintenance includes mowing grass, clearing brush, and preventing structures from being built in the ROW. As part of preventive maintenance, HRSD, using either in-house crews or outside contractors, proactively maintains the ROW, as well as monitoring street paving activities to coordinate repairs and to reduce the number of manholes and valve boxes that are covered over when the street is resurfaced.

2.10.2 Goals and Performance Measures

The goals for the amount of ROW to maintain depend on the mix of off-street and on-street ROW in the system. Some ROW may require more frequent clearing, and this is monitored by maintenance crews as they perform routine and corrective maintenance.

Goals		Performance Measures	Target Value
ROWs and easements maintenance	Maintaining access to system infrastructure in Rights of Way provides access for maintenance and repair and improves the visibility of problems.	(No. of linear feet of HRSD ROW maintenance performed per year / Goal of 132,000 linear feet/year)	87,000 ft NS 45,000 ft SS

2.10.3 Program Description / Components

2.9.3.1 Maintenance of Rights-of-Way and Easements

Accessible ROW and easements are typically mowed and cleared of brush and trash to allow maintenance access. The crews check valves, air vents, reset any castings, as necessary, and ensure that the line is properly marked to indicate that there is an underground pipeline in the area. In remote areas, such as fields, swamps and in the forest, stanchions or bollards are installed, if possible, near the valves to identify their location.

2.9.3.2 Monitoring of Street Paving

HRSD shares its Capital Improvement Plan information with all the Localities to try to avoid conflicts with repair and replacement activities. Paving schedules are reviewed to ensure work requiring excavation is completed before the streets are paved, if possible. Close coordination is needed to ensure all valve boxes, air vents, cathodic protection test stations, and manhole covers are raised to grade in conjunction with the paving.

2.9.3.3 Monitoring of Street Closures

HRSD Engineering reviews street closure information received from the Localities. HRSD reviews the street closure locations closely to ensure pipelines are not located in the right of way being vacated. If HRSD has a pipeline in the right-of-way being proposed for closure, a permanent easement is requested as part of the vacation process.

2.10.4 Training

HRSD staff is provided training on the use of the equipment needed to maintain the ROW, as well as safety awareness training on the equipment. For more detail on the training programs available to HRSD staff, please refer to Section 3.2 of this plan.

2.10.5 Information Management

The locations of rights-of-way that are cleared by HRSD staff are recorded in the CMMS. Geospatial

information on pipeline and associated right of ways are available in GIS.

2.10.6 Resource Management

For maintenance of ROW work, HRSD's Interceptor Systems Departments relies upon staff and contractors to maintain access to system components. Crews have access to a wide variety of tools and equipment to maintain the ROW. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

2.10.7 Process for Continuous Improvement

HRSD will continue to maintain the ROW with the in-house crews and contractors to minimize delays when operations and maintenance crews need to access sewer system assets for inspection or repair.

2.10.8 Implementation Plan

None identified at this time.

2.11 Sewage Treatment Plants (STPs) Operations and Maintenance

2.11.1 Program Definition and Purpose

The Treatment Department is responsible for the operation and maintenance of HRSD's 8 treatment plants as part of this MOM program (four on North Shore and four on South Shore), discharge permit compliance and solids utilization. The treatment processes used vary somewhat from plant to plant and are highly complex involving physical, biological, and chemical processes. Each facility has an Operations and Maintenance (O&M) Manual that is specific to that facility.

2.11.2 Goals and Performance Measures

The goals of HRSD's STP Operations and Maintenance Programs are:

- Provide clear and concise instructions for operators to perform critical job functions in order to maintain permit compliance.
- Prevent health and safety related accidents.
- Maintain consistent reporting procedures.
- Prevent equipment failures by providing proper maintenance.
- Provide proper response for all emergencies or disruption of operations.
- Provide training to employees on all of the above.

2.11.3 Program Description / Components

2.11.3.1 Standard Operating Procedures (SOPs)

HRSD maintains documentation and instructions for steps and activities that operators are required to perform at the STP. These SOPs are used regularly by operators to perform their job functions. These SOPs are updated from time to time to reflect changes in procedures. The SOPs include the following:

- Safety
- Administration
- Regulatory Reporting
- Sampling and Testing
- Data Recording

2.11.3.2 Operations and Maintenance (O&M) Manuals

Operating and maintenance procedures are contained in plant specific O&M manuals. All STP facilities utilize CMMS for work order generation for planned maintenance activities.

2.11.3.3 Virginia Pollutant Discharge Elimination System (VPDES) Permit

Section 402 of the Clean Water Act established the National Pollutant Discharge Elimination System to limit pollutant discharges into streams, rivers, and bays. In the Commonwealth of Virginia, DEQ administers the program as the Virginia Pollutant Discharge Elimination System (VPDES). HRSD has an excellent compliance record with the VPDES permit and has won numerous plant performance awards. Material storage and handling is carefully monitored at each plant site to prevent discharges to the storm drain. HRSD is also subjected to unannounced inspections by the Virginia Department of Environmental Quality. Procedures for handling spills at wastewater treatment are documented in HRSD's STP Response Plans.

The Regulatory Reporting Manual and the SSO RP, both kept internally on HRSD's intranet site, provide detailed protocol to address tracking and evaluation of releases at STPs. STP-related releases are not entered in the SSORS but are manually recorded and reported to DEQ under the VPDES permit.

2.11.4 Training

All HRSD staff involved in O&M functions at STPs are properly trained on appropriate portions of the SOPs and O&M Manuals. The requirements for storm water pollution prevention through the VPDES permit process is communicated to employees through the STP response plans. Spill response training is provided at each STP.

2.11.5 Information Management

HRSD's SOPs and O&M Manuals are kept on HRSD's intranet site. HRSD has an electronic system to store and manage O&M procedures and information called Operations Treatment Information System (OTIS) within HRSD's intranet site.

2.11.6 Resource Management

The Directors of Treatment are responsible for overseeing SOP updates, O&M Manuals, and additional plant specific plans as appropriate. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

2.11.7 Process for Continuous Improvement

HRSD has an electronic system called OTIS for storage of O&M manuals to allow for easier and searchable access by operators as well as increase in efficiency of the update process. OTIS has been successfully implemented at all of the eight major STP facilities and will be updated on an as needed basis.

2.11.8 Implementation Plan

None identified at this time.

2.12 Sewage Treatment Plants Storm Water Pollution Prevention Plans

2.12.1 Program Definition and Purpose

Each of HRSD's sewage treatment plants has a no-exposure certification for storm water. The plant maintains this certification by adhering to its Storm Water Pollution Prevention Plan (SWP3). This plan documents facility specific potential spill sources, best management practices (BMPs) for dealing with spills, and is a central source to document actual spills, training, and inspections.

2.12.2 Goals and Performance Measures

The goals for site specific SWP3s are as follows:

- Identify industrial activities that have the potential to contaminate storm water.
- Communicate best management practices for storm water pollution prevention to staff.
- Provide storm water drainage plans for each site.

2.12.3 Program Description / Components

2.12.3.1 Drainage Maps and Discharge Sources

Facility SWP3 contain site drainage maps to identify locations that drain to a specific storm water drain. This facilitates containment set up.

2.12.3.2 Log of Spills and Leaks

Included in the SWP3 is a log of all significant spills and leaks that entered the storm drain system within the past three years. This log is maintained by each treatment plant.

2.12.3.3 Pollutant Source Identification and BMPs

Potential storm water pollutant sources are identified in each treatment plant's SWP3. Existing management practices for each are documented and communicated to employees. Inspections of each treatment plant storm water system are conducted regularly as a condition assessment. Unloading/loading areas are inspected for cleanliness. Storage tanks are also inspected. Inspections are documented as part of the plant's records or SWP3.

2.12.4 Training

All plant personnel are required to attend an initial 'new hire' and annual refresher of storm water regulations, spill prevention and response, site specific housekeeping procedures and material management practices. Training attendance is documented as part of the SWP3.

2.12.5 Information Management

Each HRSD treatment plant maintains its own SWP3. The SWP3 will be placed in the work center's information area for employee access.

2.12.6 Resource Management

A Pollution Prevention Team is established for each treatment facility. The team can consist of the plant operations superintendent, plant operators, an Environmental Scientist, and the Permits Manager. The responsibilities of each team member are documented as part of the SWP3.

2.12.7 Process for Continuous Improvement

The SWP3 is reviewed annually and updated as needed by the plant operations superintendent then reviewed by an Environmental Scientist. Best management practices are evaluated regularly and after each event.

2.12.8 Implementation Plan

None identified at this time.

2.13 Short-Term Wet Weather Operational Plan

2.13.1 Program Definition and Purpose

HRSD has implemented a Short-Term Wet Weather Operational Plan (STWWOP) outlining HRSD's protocol in the near-term for responding to peak flow events and procedures for improvement, training, and maintenance of the plan.

2.13.2 Goals and Performance Measures

The goals of the STWWOP are to:

- Optimize performance of the HRSD system during wet weather to avoid or reduce capacity related SSOs, bypasses and unauthorized discharges.
- Provide treatment plant operators with near-term procedures for responding to peak flow events.
- Maintain treatment during and after a wet-weather event and maximize the processing of wastewater.

2.13.3 Program Description / Components

The HRSD Sanitary Sewer (SS) System and the HRSD STPs have an outstanding record of performance. As with any sanitary sewer system, system pressures and flows can increase dramatically during rain events.

HRSD will optimize the existing HRSD infrastructure to limit the occurrence of sanitary sewer overflows (SSOs) and treatment plant bypasses or upsets. The Short-Term Wet Weather Operational Plan provides the details on HRSD's protocol in the near-term for responding to peak flow events and procedures for improvement, training, and maintenance of the plan.

2.13.3.1 Interceptor System

HRSD's interceptor system has a small number of options available to minimize SSOs and reduce peak system pressures outside of the normal system operation. These options can be generally categorized under flow diversions, additional pumping assistance and control settings adjustments.

Although the HRSD interceptor system is connected in multiple locations between treatment plant service areas, the flexibility to divert flow from one treatment plant to another is limited by practical hydraulic constraints. Diversions, often involve manual operation of multiple system valves; diversion points are typically in the extremities of the service areas. Due to potential for negative impacts to the receiving system, shifting peak wet weather flow from one location of high pressure to another is often not beneficial. There are also cases where pipelines have limited ability to accept more flow due to their existing size or condition.

HRSD has temporary bypass pumps available to assist in delivering peak wet weather flows into the system, when necessary. HRSD has utilized temporary bypass pumping at several of its pumping stations where the existing pumps have been identified as insufficient to manage high peak wet weather flows. HRSD has also installed large, interim bypass pumps at locations in the system to act as interim Pressure Reducing Stations (PRSs).

PRSs are operated using pressure settings to control the activation and operation of the pumps. In most cases, the PRSs remain off until the system pressure conditions require assistance, for which the PRS then follows pre-programmed logic to select the quantity and speed of pumps required to maintain a suction pressure set-point. These automatic settings are carefully selected to balance assistance needs against potential negative consequences of allowing more flow to enter the interceptor system. Once the system no longer needs assistance, the PRS will de-activate until the next time it is required.

Pressure Control Valves (PCVs) are typically operated to maintain positive pressure in elevated pipelines that would otherwise experience vacuum conditions during typical daily flows. In some cases, they can be temporarily adjusted to allow more flow through the system during peak wet weather events.

2.13.3.2 Treatment Plants

All of HRSD's treatment plants provide at least secondary level of treatment and most provide biological nutrient removal.

2.13.3.3 Treatment Plant General Actions

The following general standard operational plan was developed to address wet weather events. Several of the plants have also developed their own plant-specific wet weather procedures that complement the general operational plan.

General Procedures

- Conduct a preventive maintenance (PM) program, to maximize available equipment and tanks.
- Make provisions for needed personnel to be on call or preferably on-site during a wet weather event. Verify that all chemical storage tanks are sufficiently full to address the demand during the wet weather.
- Test the on-site backup power monthly.
- Verify that there is sufficient fuel to run the on-site backup power system for the anticipated duration of an event.

Procedures per Unit Process

Preliminary Treatment: Screening and Grit Removal

- Available screens and manual bar screens (where applicable) are placed into service, as needed.
- Available grit systems are placed into service, as needed.

Primary Clarification (where applicable)

- Place any available offline tanks online during peak flow events, as needed.

Biological Process

- Place any available offline tanks online during peak flow events, as needed.

Secondary Clarification

- Place any available offline tanks online during peak flow events, as needed.
- Check sludge blankets and add coagulant or polymer to facilitate solids settling, if necessary.
- Evaluate reducing internal recycles and return activated solids (RAS) pumping.

Disinfection

- Place any available offline tanks online during peak flow events, as needed.
- Continue chlorination.
- Continue de-chlorination where applicable.

2.13.4 Training

HRSD provides ongoing training. This training provides the means for those involved in operating the system during peak flow events to acquire skills that fulfill their roles. Ongoing formalized operational training is provided by HRSD's apprenticeship program (see Section 3.2). Treatment Plant Operators and Interceptor Technicians graduate from this program with a Virginia Department of Labor (VDOL) licensed Journeyman's card and gain the experience and knowledge needed to react and respond to the various issues that may arise from a multitude of operational scenarios. Implementing the STWWOP also helps to determine where enhancements are necessary, so that revisions to the plan can be made accordingly.

2.13.5 Information Management

The STWWOP is available electronically on HRSD's internal network.

2.13.6 Resource Management

Staffs at each treatment plant are responsible for implementation of the STWWOP. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

2.13.7 Process for Continuous Improvement

The Treatment Plant Superintendents, Treatment Process Plant Engineers and Directors of Treatment evaluate plant and operator performance following major peak flow events. Opportunities for improvement are identified to be used in future wet weather events. Improvements may be as simple as making staffing adjustments or may involve other modifications.

The STWWOP document is reviewed as people, processes and systems change. Review of the plan typically occurs when there is a change in the wastewater system.

HRSD has constructed two off-line storage tanks to provide for additional wet weather capacity. These tanks provide a means to divert flows from the system during rain events, thereby reducing system pressures and allowing the localities to pump more flow. After the rain event subsides, the tanks are then drained during dry weather conditions when the system can easily handle the additional flows. These tanks have been strategically located to provide for hydraulic improvements in areas of the system that have experienced capacity restraints in the past. Numerous off-line storage tanks are planned to be constructed throughout the system. Currently, there are tanks under construction, under design, and scoped in future CIP projects.

The newly deployed SCADA system allows for remote control of the HRSD Pump Stations, PRSs, off-line storage tanks, and control valves. Maintenance staff has begun to use these remote-control capabilities to better operate the system during significant rain events and emergency situations. Lowering control valve set points and slowing down larger pump stations to allow for smaller stations to catch up from surcharge conditions have led to significant capacity improvements and at times have been used to eliminate a SSO during wet weather events. HRSD will continue to pursue operating strategies that consider system constraints not local to the controller to provide for enhanced system capacity through remote operations.

2.13.8 Implementation Plan

None identified at this time.

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2.14 Sewage Treatment Plant (STP) Response Plans

2.14.1 Program Definition and Purpose

Response plans are provided at each plant so that employees have knowledge of what to do in case of a fire, chemical spill, or other emergencies. Response procedures are tailored for each plant and are updated annually by HRSD's Safety Department so that procedures remain accurate.

2.14.2 Goals and Performance Measures

The goals for the STP Response Plans are to provide treatment employees the knowledge to safely perform in an emergency by documenting:

- Fire and Evacuation Procedures
- Chemical Release Procedures
- Wastewater Spill Procedures
- Regulatory Reporting Procedures
- Emergency Contact Lists
- Related Safety Procedures

Goals		Performance Measures	Target Value
Response Plan Training	Employees will be trained annually on Response Plans to ensure adequate knowledge of what to do in case of fire, chemical spill, or other emergency.	(No. Work Center Response Plan Training Sessions held during year/ No. of Work Centers) *100	100%
SWP3 Training	Employees will be trained in an initial "new hire" session and annual refresher training courses to ensure adequate knowledge of stormwater regulations, spill prevention and response, site-specific housekeeping procedures and material management practices.	(No. Work Center SWP3 Training Sessions held during year/ No. of Work Centers) *100	100%

2.14.3 Program Description / Components

2.14.3.1 Critical Valves

Work centers that have chemicals mark critical valves as indicated on chemical system diagrams. The marking system makes the critical valves easy to identify.

2.14.3.2 Wastewater Spill Response

Each work center has a separate Storm Water Pollution Prevention Plan (SWP3), which includes diagrams of each plant and location of storm drains. Response Plans contain chemical line diagrams and critical valve locations and documents procedures for mitigation, containment, clean-up and reporting of wastewater releases.

2.14.4 Training

HRSD employees receive annual training on their work center's Response Plan. The HRSD Safety Department conducts this annual training. Supervisors train all new employees on the Response Plan.

2.14.5 Information Management

Each HRSD work center has the most up-to-date version of that work center's Response Plan. The Response Plan is placed in the work center's information area for employee access. Work center Response Plans are also available on HRSD's intranet site.

2.14.6 Resource Management

The Safety Department updates HRSD STP Response Plans on an annual basis so that the procedures remain accurate and current.

2.14.7 Process for Continuous Improvement

The Safety Department evaluates work center Response Plans at least quarterly during safety inspections. This audit includes checking if the most up-to-date Response Plans are available at the work center. The following are also evaluated during the audit: fire extinguishers, fire protection systems, exits, marking of critical valves, spill/leak control supplies/equipment, and signage.

2.14.8 Implementation Plan

None identified at this time.

3. SUPPORT PROGRAMS

3.1 Safety

3.1.1 Program Definition and Purpose

The purpose of HRSD's Safety Program is to conduct all operations and maintenance activities in a safe manner to eliminate or reduce accidents, personal injuries, and property damage. The HRSD Safety Department is responsible for the overall safety program of all divisions as well as workers' compensation. HRSD performs quarterly safety inspections and ensures that all HRSD's facilities and workers are meeting safety requirements.

3.1.2 Goals and Performance Measures

The goals of HRSD's safety program are to:

- Eliminate or reduce accidents, personal injuries, and property damage
- Ensure a safe place to work for all employees
- Provide education and safety training to all employees
- Provide appropriate Personal Protective Equipment (PPE) to ensure safety in job duties
- Comply with HRSD, State and Federal safety regulations
- Manage workers' compensation claims for HRSD employees

	Goals	Performance Measures	Target Value
Recordable Incidents	Reduce accidents, injuries, and property damage to protect employees by implementing proactive safety policies and procedures.	Safety and Security Manager will keep record of all OSHA Reportable accidents.	Fewer than 50 OSHA Reportable injuries per year
Lost Time accidents	Reduce accidents, injuries, and property damage to protect employees by implementing proactive safety policies and procedures.	Safety and Security Manager will keep record of all Lost Time accidents.	Fewer than 10 lost- time accidents per year
Work Safety	To maintain a safe work environment by conducting safety inspections on a routine basis.	(Quarterly safety inspections performed per year / Four safety inspections to be performed per year) X 100%	100%

3.1.3 Program Description / Components

HRSD's Safety Program includes:

- Confined Space Entry.
- Lock Out/Tag Out.
- Personal Protective Equipment.
- Hazard Communication.
- Respiratory Protection.
- Hearing Conservation.
- VDOT Flagging Certification.
- Hot Work Permit.
- Excavation Safety.
- Asbestos Awareness.

- Safe-Driving.
- Electrical Safety Program.
- Emergency Response Procedures.
- Fall Protection.
- Chemical Hygiene.
- VDOT Work Zone.
- CPR/First Aid/AED/Bloodborne Pathogens.
- Air Vent Training.
- Elevated Work Platform Training.
- Telehandler Training.
- Forklift Training.
- HAZMAT Training.
- Overhead Crane & Hoisting Training.
- Truck Crane Training.

The HRSD Safety Department is responsible for the overall safety program of all divisions. They perform routine safety inspections and ensure that all HRSD's facilities and workers are meeting safety requirements. They provide many levels of training to employees on safety, health, and first aid. The complete safety plan is detailed in the HRSD Safety Standard Operating Procedures (SOP). This SOP is updated as needed.

HRSD has a Safety Team consisting of employees appointed by their division chiefs. This team acts as an advisory group on safety policies and issues, provides general direction and input to the Safety Section on programs and keeps their divisions informed about safety issues.

3.1.3.1 Safety Procedures

Safety rules describe required practices and procedures for safely performing routine and non-routine activities in a safe manner. HRSD personnel are responsible for familiarizing themselves with all safety rules and are mandated to follow all HRSD safety rules in the performance of their daily activities while at HRSD facilities or when representing HRSD off site. Supervisors are responsible for: informing, explaining, and publicizing all safety rules to their personnel; enforcing observance of all safety rules by HRSD personnel; and ensuring each employee has access to a copy of HRSD's safety rules. All current safety rules and practices are defined in HRSD's Safety SOP. The Safety Department is responsible for developing and updating programs and procedures such as:

- Development of HRSD programs to ensure compliance with OSHA requirements.
- Safety training.
- Safety inspections.
- Accident investigations.
- Auto Accident and Decision Driving Training.
- Construction Walk arounds.
- Respirator Medical Questionnaires, Respirator Physicals and Respirator fit testing.
- Audiometric testing.
- Air sampling and environmental audits.
- SARA Title III submissions.
- Development of emergency response procedures.
- Documentation of training, sampling, inspections, and medical information.
- Issuance of Safety Notices.
- Crisis management functions as outlined in HRSD's Workplace Violence Prevention Policy.
- Retrieves available video to address security issues.
- Air sampling for hazards using all media types.
- Communication of relevant safety information to all employees.
- Asbestos inspections, air sampling and limited removal/clean-up activities.

3.1.3.2 Personal Protective Equipment

HRSD is committed to creating the safest environment possible for its employees. HRSD provides all employees with job-specific Personal Protective Equipment (PPE) upon initial hire, as ongoing or changing duties necessitate, and replaces equipment on an as-needed basis.

3.1.4 Training

Safety training is an ongoing requirement for HRSD employees. Regular training is provided to safely perform all types of activities, including confined space entry, traffic control, electrical maintenance, pump station operations and maintenance, trenching and shoring. Employees often go through on-the-job drills to assess their knowledge in addressing dangerous situations and to ensure they have been adequately trained. Operations work centers have monthly safety training meetings to provide continuous safety training on task specific job duties and to maintain a high level of safety awareness. All employees must attend a new employee safety orientation. This training is two full days for Operations and Engineering employees, full day for Water Quality employees and half a day for office employees.

HRSD's safety training is provided through several different methods:

- Manufacturer training.
- On-the-job training.
- Online training.
- In-house classroom training.
- Industry-wide training (including webcasts).

A training calendar is published yearly to track all safety related training and certifications. If an incident occurs or if there is a new or updated safety regulation, HRSD may deviate from training calendar to provide additional incident specific training to increase employee awareness.

3.1.5 Information Management

Records of employees' attendance at safety training are kept in a training database and in hard copies within personnel files. Training and medical records are kept for a minimum of 30 years after the employee's last date of employment. Each work center also maintains hard copy files for safety and job-related training.
Employees are scheduled for refresher training or to renew certifications as required. The Safety SOP document is maintained on the HRSD Intranet site.

3.1.6 Resource Management

The HRSD Safety Section is responsible for the overall safety program and workers compensation of all divisions. They perform routine safety inspections and ensure that all HRSD's facilities and workers are meeting safety requirements. The Safety Department is also responsible for managing workers' compensation claims for HRSD employees.

HRSD's safety program is overseen by the Chief People Officer and managed full time by a Safety and Security Manager. The Safety and Security Manager is responsible for MOM related requirements. There are three full-time Occupational Health and Safety Professionals and one Safety Specialist designated to the safety program. The Safety and Security Manager performs budgeting, reporting and managerial tasks. Training, sampling, and other safety related duties are split between all employees in the Safety Department. The Safety Specialist also handles all aspects of workers' compensation claims. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

HRSD's safety program requires various sampling equipment including but not limited to air monitors, audiometers, spirometers, etc.

3.1.7 Process for Continuous Improvement

HRSD strives to continually evaluate and update its Safety Program as needed. This is done through employees recognizing needs for improvements, annual planning/review within the Safety Department, process improvements, chemical substitutions, or eliminations, when possible, a Safety Recognition Program for employees, Safety Innovation Awards Program held annually, and periodic updates to Safety SOPs and training calendars.

HRSD is currently working on updating its recordkeeping process, which will also include its safety records. Records of new employee safety training and specific job duty training will be stored in a new system.

3.1.8 Implementation Plan

None identified at this time.

3.2 Training

3.2.1 Program Definition and Purpose

Comprehensive employee training programs and generous educational assistance benefits have contributed greatly to HRSD's success. HRSD embraces a continuous learning philosophy that requires all employees to complete the training necessary to ensure the safe and effective performance of duties.

3.2.2 Goals and Performance Measures

The goal of HRSD's training program is to train all employees to perform job duties safely and effectively and provide training opportunities for career advancement. Training hours and/or activities, such as professional development, apprenticeship, safety, college, manufacturer, short school, etc., are tracked either in HRSD's Oracle Enterprise Resource Program (ERP) or in departmental training records.

3.2.3 Program Description / Components

Continuing education, professional development programs, and generous educational assistance benefits have contributed greatly to HRSD's success. HRSD embraces a continuous learning philosophy that requires all employees to complete the training necessary to ensure the safe and effective performance of duties. Each new employee must attend the standard New Employee Orientation and New Employee Safety Training. Subsequent training is based on individual needs, position requirements and advancement goals. Components of the Training Program which are described below include:

- Apprenticeship Program.
- Continuing Education.
- Human Resources Training.
- Leadership and Supervisory Programs.
- Professional Development.
- Quality Improvement Programs.
- Safety Training.
- Skills Training Program.
- Technical Training Programs.

3.2.3.1 Apprenticeship Program

HRSD created the nation's first wastewater industry-related apprenticeship program to maintain excellence in the workforce. The Apprenticeship Program is recognized and approved by the Virginia Department of Education and the Virginia Department of Labor & Industry and is administered under the auspices of the Virginia Department of Labor & Industry's Office of Apprenticeship. The Apprenticeship Program offers apprentice able trades to qualified applicants to allow them to gain the education and experience necessary for a successful career within the field of wastewater treatment. For the Operations Division, HRSD currently offers apprenticeships in the following trades: Carpenter, Electrical & Instrumentation Specialist, Interceptor Technician, Machinist, Maintenance Operator, and Plant Operator.

These apprenticeships provide formal training through academic and practical instruction in the various aspects of each skilled trade. Apprentices are educated in the theory and practices of wastewater collection and treatment and acquire the skills and knowledge necessary to become fully qualified in their respective trades. Apprentices in the Plant Operator trades obtain the skills and training credits needed to earn their Wastewater Works Operator licenses. As incentive to successfully complete the program, participants in the program are eligible to receive training increases upon completion of specific program requirements. Apprentice positions require successful completion of the Apprenticeship Program or approved equivalent program as a condition of continued employment.

3.2.3.2 Continuing Education Reimbursement

To provide an incentive for employees to enroll and successfully complete college courses, HRSD will

provide advanced payment and/or reimbursement of tuition fees to qualified employees who attend college to earn a degree needed to meet job requirements or prepare for advancement. HRSD reimburses employees for each course they successfully complete.

3.2.3.3 Human Resource Training

Human Resource (HR) training is provided based on the needs of the organization and compliance with regulations. Training programs are routinely developed and updated based on changing regulations and needs. HR foundational training programs for employees include:

- **New Employee Orientation (NEO):** All new employees, full-time and part-time, spend their first day of employment in NEO. HR staff cover a variety of topics from policies and procedures to benefits, wellness program and ethics and Information Technology (IT) staff review the IT policy. All new employees meet with the General Manager for an introduction to HRSD and there is an opportunity to have lunch with their Division Chief. Employees receive training on the ERP to learn basic information including how to complete timecards, submit leave requests and enroll in benefits.
- **Equal Employment Opportunity (EEO) Policy Training:** This training is provided to all employees to provide an understanding and compliance with HRSD's EEO Policy.
- **HR Policy Training:** As necessary, training may be provided to all employees when there are significant changes to current a policy or an introduction of a new policy.
- **Ethics Training**: Annually, Human Resources provides training focused on ethical employee decision making to ensure understanding and compliance with applicable regulations.

Supervisors are provided additional HR training to include:

- **New Supervisor Training**: Provided to all newly promoted or hired supervisors to review policies and procedures for Recruitment and Hiring, Family Medical Leave Act (FMLA) and Worker's Compensation. These are important HR policies and procedures for new Supervisors to learn and to understand their impact on employees and the workplace. ERP Manager Self-Service procedures and features are reviewed including how to approve timecards and leave requests, to perform appraisals and to view information related to direct reports.
- **Interview Training for Hiring Managers**: HRSD's organizational consultant partners with HR staff to provide training to hiring managers which encompasses tools and resources to use in the development of job descriptions, interview questions, evaluation process and selection and reference checking.
- **Americans with Disabilities Act (ADA) and FMLA**: These regulations can have a high impact on HRSD and employees. Policies and procedures are reviewed with supervisors to provide a basic understanding and how to recognize and properly address these situations by partnering with HR staff.

3.2.3.4 Leadership and Supervisory Programs

HRSD believes we, as employees, are responsible for our future success and that personal growth is the foundation for improvement. L&D works with divisions and teams throughout the organization to increase employee engagement and internal collaboration and build a culture and strategy supporting HRSD's continued and future success. L&D administers a leadership development program, Leadership Ethics, and Accountability Program (LEAP) for front line supervisors. In addition, L&D hosts several other developmental workshops, such as Creating Effective and Collaborative Meetings, Leadership and Ethics, Learning Styles, Oz Principle, Project Management, Real Colors, Situational Leadership, and Strengths Finder. More details can be found in the L&D Training Catalog.

LEAP is designed for first-time supervisors. It provides essential material to prepare and establish new front- line leaders with training that develops essential supervisory skills. We understand that investing in new supervisors increases productivity and organizational effectiveness, resulting in engaged, high-

performing workgroups. The program includes an orientation to the organization, a communication and emotional intelligence assessment (DISC Agile EQ), Organizational Learning, Communication, Productive Conflict, and Management Conflict, Creating Trust and Fostering Motivation, Coaching, Diversity, Equity, Inclusion, and Unconscious Bias, Ethics, Feedback, Building High-Performance Teams, and the completion of Individual Development Plans.

3.2.3.5 Professional Development

HRSD encourages and supports employee initiative in professional development, advance study, continuing education, legal registration, license, certification, and participation in professional, scientific, technical, management and civic organizations.

3.2.3.6 Quality Improvement Programs

HRSD has been a Quality Improvement organization since the early 1990s. HRSD employees complete extensive training on integrating quality improvement practices into the workplace. In-house facilitators and outside consultants continually train HRSD personnel to recognize and implement organizational and self- improvement activities. The Quality Steering Team ensures the program continually meets the goals of the organization. More details can be found in the L&D Training Catalog.

Workplace Facilitators teach all new employees the basics of quality improvement through the Your Role in Quality (YRIQ) course. This course explains what quality improvement is about and culminates with each employee developing a personal action plan and/or workplace project to improve at least one element of their work.

HRSD is committed to training leaders and has in-house Quality Facilitators and outside consultants who train employees in leadership and management type skills. LAMA is designed for upcoming and established supervisors that are seeking advanced leadership skills to create high performing teams. These enhanced leadership skills build off the foundational skills learned in LEAP and involves a year-long cohort project aimed at solutions to widespread issues facing HRSD as an organization. The program includes orientation to the management program and cohort participants, design thinking model, inclusive workplaces, Everything DiSC, emotional intelligence, motivation and alignment, ethics in leadership, StrengthsFinder, conflict and change management, and Covey's 7 Habits.

Teamwork and Problem-Solving (TAPS) addresses problem solving and the ability of team members to develop creative solutions to pressing organizational challenges. The goals of the training are to teach how to work optimally on a team and learn how to build effective teams. The workshop objectives are natural planning, 5 Dysfunctions of a Team, Productive Meetings, and Problem Solving. This facilitated class is taught by the TAPS facilitators.

3.2.3.7 Safety Training

See Section 3.1 for information regarding Safety Training.

3.2.3.8 Skills Training Program

HRSD has an extensive training program to teach the individual skills needed to be effective in all facets of work at HRSD. Training is provided by experienced, in-house staff and outside instructors. In addition, employees have opportunities to attend workshops and webcast seminars.

HRSD helps its employees achieve professional registration/certifications that enhance their professional credentials such as wastewater operator licenses, commercial driving licenses and many others that may be required of the employee.
Each work center oversees their required on-the-job training programs.

3.2.3.9 Technical Training Programs

Technical training and refresher training requirements vary with each position. Each division funds the training of its employees, which can include participating in off-site classes or seminars, attending conferences, obtaining a college degree, and meeting professional licensing requirements. HRSD also

organizes on-site classes for employees to improve their technical knowledge, skills, and abilities.

3.2.4 Training

Staff members who administer training programs are provided on-the-job training and external certification and/or instructional training for specific job responsibilities.

3.2.5 Information Management

Employee's training records are currently maintained in HRSD's ERP or on HRSD's network. HRSD utilizes a web-based Learning Management System (LMS) to manage online course learning materials and communicate learning achievement.

3.2.6 Resource Management

Employees working under the Chief People Officer are dedicated to training, employee development progress and safety-related training. Work center supervisors also provide training to employees on an as needed basis. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

3.2.7 Process for Continuous Improvement

HRSD strives to continually evaluate and update its Training Program as needed. Employees working under the Chief People Officer are working to migrate training into e-Learning environments where feasible.

3.2.8 Implementation Plan

Program Milestone	Description	Time Frame
Compliance Training and Tracking Software	Implement compliance training and tracking software	July 2026

3.3 Public Information and Communications

3.3.1 Program Definition and Purpose

Every HRSD division is committed to providing the highest levels of customer service. Accordingly, HRSD is committed to communicating effectively and efficiently with the public and the media; with advocating for, promoting, and exhibiting environmental stewardship; and with offering environmental education opportunities to HRSD customers, stakeholders and to the public. The Communications Division is responsible for coordinating HRSD's information, communications, public education, and environmental stewardship activities.

HRSD has prepared a Communications and Public Response Plan and a Crisis Communications Plan which provide guidance for public communications during emergencies and crisis situations.
HRSD has prepared a Public Participation Program in conjunction with the Regional Wet Weather Management Plan (RWWMP). This program has the following elements:

- Website information
- Annual informational meetings.
- Annual newsletter.
- Public information about SSOs.

3.3.2 Goals and Performance Measures

The goals of this division and HRSD's public information and communications program are to*:*

- Inform the public appropriately of major HRSD construction projects, emergency repairs and major maintenance activities.
- Provide wastewater treatment related environmental education to the public.
- Inform customers about environmental issues related to wastewater treatment.
- Organize formal meetings and open houses to brief the public on certain major projects.
- Coordinate communications with the public, the media, the regulatory community and with other localities and stakeholders.

3.3.3 Program Description / Components

3.3.3.1 Public Information Programs - Communications

HRSD uses a variety of outreach strategies to ensure the public is properly informed. HRSD's website, HRSD.com, is an important public information tool. In addition to providing information about the organization, customer services, bill payment and business opportunities for vendors, the site includes information on major projects. Project webpages are established and updated regularly to provide current information regarding the status of construction, emergency repairs and major maintenance activities.
HRSD organizes community meetings and open houses to brief the public on certain major projects. These meetings are publicized extensively through social media channels, newspaper advertisements, notices to public officials, letters to civic associations, NextDoor app and flyers distributed to the affected community.

To notify residents of planned activities such as routine maintenance and smoke testing, HRSD uses door hangers in the areas that will be affected. A special hanger is sometimes distributed when a significant spill occurs to provide information about cleanup activities and safety issues. Flyers and notices are also distributed to residents of neighborhoods affected by a major construction project. HRSD staff may visit homeowners and businesses to explain projects that could result in an inconvenience.

HRSD's contractors may be required to erect signs at the site of major projects to provide information such as the project webpage and an HRSD phone number to call for more information. Please refer to the

Public Communication Program section of the standards located at www.hrsd.com/standards for more information.

HRSD employees are available to provide on-site tours, speak to civic organizations, schools, and other groups on a variety of topics including projects. Special presentations are provided to local, state and federal elected officials and their staff; other government officials; and utility personnel as appropriate. HRSD has established an Ambassador program to assist in public outreach and has virtual tools to provide additional outreach and educational opportunities.

Senior managers periodically conduct briefings for reporters. HRSD has prepared a Communications and Public Response Plan and a Crisis Communications Plan, which provide guidance for public communications during emergencies and crisis situations.
HRSD has prepared a Public Participation Program in conjunction with the RWWMP. This program has the following elements:

- Website information.
- Annual informational meetings.
- Newsletter.
- Public information about SSOs.

3.3.3.2 Environmental Education Programs- Communications

HRSD's commitment to environmental education is demonstrated through a variety of special programs, partnerships, and initiatives. HRSD uses an assortment of outreach methods to inform the public about the importance of wastewater treatment and what they can do to help protect area waterways. HRSD's social media efforts, help deliver its messages to a broad audience.

As a member of the askHRgreen.org initiative, HRSD contributes to regional campaigns that focus on wastewater infrastructure awareness and "Down the Drain" messages for the public. These messages reach a wide audience via the "Green Living" blog, which features HRSD content shared from HRSD's own blog, "Making Waves," as well as through other askHRgreen.org marketing efforts delivered through radio, newspaper, magazine, billboard, theater, and other online/social media avenues. "Down the Drain" topics, including proper FOG (fats, oils, and grease) disposal, are stressed in the frequent tours of HRSD facilities, numerous classroom presentations by HRSD staff and HRSD's participation in an array of community events and environmental festivals. These education and outreach activities also provide an opportunity for HRSD to inspire the pursuit of environmental careers.

Successful ongoing programs include the "Pump Out, Don't Dump Out" boater education program. HRSD, the Virginia Department of Health (VDH), the Sport Fish Restoration Program and the City of Virginia Beach partnered to promote the proper disposal of wastewater from sanitary holding tanks on boats to prevent dumping of sewage into the waterways. Specially trained interns visit marinas, local festivals, and even homes to educate recreational boaters and demonstrate proper tank pump out procedures.

HRSD's partnership with WHRO Public Media's Batten Environmental Educational Initiative provides an additional outlet for distribution of educational materials, lessons, and other multi-media environmental learning content for students of all ages.

Environmental Improvement Fund Grants, which are awarded by the Water Quality Division for pollution prevention activities and environmental education, are funded by civil penalties paid by businesses and industries that fail to meet their permit requirements. To encourage middle school and high school students' interest in science and the environment, HRSD also uses these funds annually to recognize selected Tidewater Science and Engineering Fair projects that demonstrate potential to improve water quality.

The Tara Welch Gallagher Environmental Scholarship (formerly known as the HRSD Environmental Scholarship), which is administered by the Hampton Roads Community Foundation, was endowed by a grant from the Environmental Improvement Fund. The scholarship recipients must be graduate students who reside in HRSD's service area attending a public university in the Commonwealth of Virginia and be enrolled in one of the following disciplines: environmental health, environmental chemistry, biology, or civil or environmental engineering.

3.3.4 Training

Each new Communications Division employee is provided a two-week orientation session to generally familiarize them with all functions performed by this division. Media response training and Crisis Communications training is also provided to communications division employees and all HRSD managers and other subject matter experts.

3.3.5 Information Management

HRSD archives news releases on the website https://www.hrsd.com/newsroom.

3.3.6 Resource Management

The Chief Communications Officer reports directly to the Chief Financial Officer. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

3.3.7 Process for Continuous Improvement

Actively reviewing "branding" efforts to be recognized by the community to help customers understand what HRSD does and the value we bring to public health and the environment.

3.3.8 Implementation Plan

None identified at this time.

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3.4 Customer Care Center Department

3.4.1 Program Definition and Purpose

Every HRSD division is committed to providing the highest levels of customer service. The Customer Care Center department provides billing services and responds to customer inquiries.

3.4.2 Goals and Performance Measures

The goals of this program are to:

- Provide billing services.
- Provide prompt and courteous responses to telephone or e-mail inquiries regarding billing issues or other concerns.

3.4.3 Program Description / Components

3.4.3.1 Customer Care Center Department

HRSD's Customer Care Center Department staffs a call center Monday through Friday, 8:00 a.m. to 5:00 p.m. Employees trained in customer service provide prompt and courteous responses to telephone inquiries regarding billing issues or other concerns. This department also provides billing services, accepts payment, and follows collection plan when payment has not been received as billed. The department works with the various Localities in regard to billing issues.

The Customer Care Center Department is responsible for responding to ratepayers' questions, sending bills and posting payments. The department is responsible for the billing and collection of wastewater treatment charges related to approximately 486,000 customer connections. HRSD's customer accounts are established and maintained based on the water and sewer connection information provided by the Localities within HRSD's service area. The periodic billing of wastewater treatment charges is based on the metered water consumption information provided by the Localities we serve.

HRSD offers Localities the option of utilizing HRSD's billing service that provides bill printing and payment processing at no cost. For participating Localities, instead of receiving multiple bills, customers receive one consolidated bill. A variety of methods are used for billing based on the procedures specified by each of the participating Localities.

During evenings, weekends and holidays, an answering service takes calls and contacts HRSD as needed to ensure that a responsible party is always available to handle reports of emergencies that might affect public health or the environment. A 24-hour Interactive Voice Response System is available, and a toll-free number, 1-888-ASK-HRUBS (1-888-275-4782), enables customers throughout the region to call at no cost.

3.4.4 Training

Each new Customer Care Center Department employee is provided at least a four-week orientation session to familiarize them with the functions performed in the Customer Care Center. An experienced employee works with the new employee for the first two to three weeks of their actual job duties.

3.4.5 Resource Management

The Customer Care Center Department is led by the Director of Customer Care who reports to the CFO. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

3.4.6 Process for Continuous Improvement

Customer care surveys are conducted bi-annually. Additionally, the Customer Care Center Department is

evaluating the implementation of end-of-call surveys.
The Customer Care Center Department collaborates with the IT Division to evaluate business process workflows and available software for development and improvement of customer service.

3.4.7 Implementation Plan

Program Milestone	Description	Time Frame
Customer Engagement Portal	Implement Customer Engagement Portal	September 2024

3.5 Water Quality Monitoring Program

3.5.1 Program Definition and Purpose

HRSD has an extensive monitoring program, which analyzes wastewater and solids at various stages of treatment. Not only is fully treated, disinfected effluent analyzed, but samples are also taken of raw influent and at various process units throughout the treatment facility.

3.5.2 Goals and Performance Measures

The goal of the Water Quality Monitoring Program is to maintain 100-percent compliance with VPDES permits.

Goals		Performance Measures	Target Value
WQ - Monitoring	Maintain compliance with VPDES permits to protect the public safety and the environment.	Annual number of permit exceedances per plant	< 6 exceedances per plant per year

3.5.3 Program Description/Components

As mentioned above, wastewater is analyzed at various stages of treatment. Storm water management at HRSD treatment facilities is required under the VPDES regulations. Material storage and handling is carefully monitored at each plant site to prevent discharges to the storm drain. HRSD CEL is accredited as a commercial laboratory under the Virginia Environmental Laboratory Accreditation Program (VELAP) and is inspected every two years. HRSD is also subjected to unannounced inspections by the Virginia Department of Environmental Quality.

HRSD provides water quality monitoring assistance and analytical services to the Localities through HRSD's Municipal Assistance Program (MAP). These monitoring activities may include fecal indicator bacterial monitoring as well as monitoring for other parameters at storm water outfalls. HRSD also participates in special initiatives with regional partners such as microbial source tracking referenced in Section 3.20.

3.5.3.1 Routine Water Quality Monitoring Program

A Wastewater Characterization program is conducted for screening purposes. Treatment plant operators follow an emergency reporting procedure to report any change in influent pH, odor, color, or general appearance. In addition, any process failure such as loss of chlorine residual is reported.

3.5.3.2 Investigative Water Quality Monitoring Program

An important part of industrial waste control at the publicly owned treatment works is the ability to locate, and hold liable, sources of unusual discharges that cause treatment difficulties.

Members of the HRSD P3 Department will respond and work to locate the source and ultimately cease the discharge of any unusual substance into the collection system that may adversely impact the collection system or treatment facility. Enforcement mechanisms to assign liability for damages to sources of upsets and to terminate service are provided for in the HRSD Industrial Wastewater Discharge Regulations, Part VI, Violations and Enforcement. Enforcement activities under these regulations sometimes result in the collection of civil penalties from violators. This money is re-invested in award luncheons and other environmental improvement activities. Additionally, the overall quality of HRSD effluent has been improved as a result of reduced and properly pretreated industrial waste discharge.

3.5.3.3 Water Quality Monitoring for Spill Impact

The Technical Services Department of the Water Quality Division may initiate environmental monitoring of receiving waters after major spills. A major spill is assumed to be a spill which is of sufficient magnitude to have the potential to affect water quality. The magnitude of the spill to trigger a sampling event, as well

as the parameters to be monitored for, is variable depending upon several factors such as the sensitivity of the affected water and its uses (e.g., shellfish or swimming waters or sensitive spawning areas), the season of the year, or the magnitude of antecedent conditions. Spills resulting from extreme events such as hurricanes or extreme northeaster storms are typically not sampled due to the dominance of nonpoint source impacts on the receiving waters.

The Technical Services Department is responsible for environmental monitoring, data analysis, regulatory negotiation, reporting and administration of air and water permits, management of local storm water support programs and performs special studies to support operations. The Division has watercraft from which they can monitor receiving waters to determine the effects of discharges from HRSD facilities or its collection system on the local waterways.

3.5.3.4 Industrial Waste Monitoring

HRSD's P3 Department is responsible for the control of all non-domestic waste discharged into HRSD's system. P3 regulates industrial and commercial discharges through application of HRSD's Industrial Wastewater Discharge Regulations. These regulations include general and specific effluent limitations and regulatory control mechanisms (e.g. permits and BMPS). Compliance is ensured through the implementation of an extensive monitoring program where HRSD monitors industrial users. The industries also perform self-monitoring activities to ensure they are meeting permit limits. HRSD conducts work week wastewater monitoring surveys of industries at least annually, utilizing automatic samplers to collect 24-hour composite samples. In addition, all permitted industries are grab sampled and spot checked on a random, unannounced basis.

3.5.3.5 Central Environmental Laboratory

The HRSD's state-of- the art Central Environmental Laboratory is responsible for analytical testing and providing quality laboratory data for internal analysis and regulatory control. The Central Environmental Laboratory maintains accreditation through the Virginia Environmental Laboratory Accreditation Program (VELAP) and uses the latest technology to monitor treatment processes, industrial discharges into the system, and the condition of local waterways. Some laboratory tests are completed through contract labs on an as needed basis.

3.5.3.6 Microbial Source Tracking

HRSD implemented its Microbial Source Tracking program, which is a focused water quality monitoring effort, in partnership with local governments and the Virginia Department of Health. It has been successfully used to identify, locate, and eliminate chronic and persistent non-SSO-related sources of human-sourced bacteria.

The Molecular Laboratory in TSD is responsible for conducting human-specific molecular analyses to detect human sources of bacteria in stormwater, surface water and sewer infrastructure samples. This program can be further referenced in section 3.20.

3.5.4 Training

The treatment plant operators participate in a four-year apprentice program working toward a class 1 license, which qualifies them for pay incentives.
Laboratory analysts are trained in-house and maintain demonstration of capability requirements under VELAP using EPA-approved methods.

3.5.5 Information Management

The Environmental Data Management System (EDMS) includes the and Laboratory Information Management System (LIMS), the Pretreatment Information Management System (PIMS) and the Treatment Data Management System (DMS) in addition to other systems in use throughout HRSD to form an integrated, interdepartmental information management systems. The LIMS provides storage for all analytical results generated by the CEL and is used for regulatory and operational purposes by several HRSD divisions and

departments. LIMS is designed to follow applicable US EPA protocols and good automated practices for sample and data management. The Laboratory uses LIMS for many aspects of data and sample management. LIMS functions include automated generation of chain of custody, analytical requests and sample labels, sample receipt, automated data transfer from instrumentation, data validation and approval, generation of data reports and data storage.

The CEL LIMS and Operations DMS are integrated to facilitate data flow from the CEL to Operations and vice-versa to allow for robust data compilation from both systems for compliance, process monitoring and research purposes. Hourly data generated at each facility is recorded and used to perform flow and process calculations. LIMS serves as a permanent repository of data for historical purposes and for cross plant reporting. In addition, it ensures the quality and completeness of collected information. Data also are automatically transferred from LIMS to PIMS. The PIMS provides a comprehensive database that stores industrial and commercial facility information as well as field data generated by the Pretreatment and Pollution Prevention (P3) Department, wastewater volume and pollutant concentration of industrial discharges.

Advantages of using interdepartmental data management systems include streamlined procedures that increase efficiency, consolidated hardware and software maintenance, easier access to shared information and reduced training efforts, all of which result in an overall cost savings.

3.5.6 Resource Management

The employees in the Water Quality Division work under the direction of the Chief of Water Quality. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.
Contract laboratories are utilized if needed to meet demand.
The Central Environmental Laboratory utilizes state-of-the-art analytical equipment.
Research vessels are used for ambient waters and various other vessels are used for other Water Quality purposes.

3.5.7 Process for Continuous Improvement

The Laboratory develops new analytical methods as necessary.

3.5.8 Implementation Plan

Program Milestone	Description	Time frame
VELAP accreditation	Meet the standards required to maintain VELAP accreditation.	Annual renewal of accreditation

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3.6 Pretreatment & Pollution Prevention (P3) Programs

3.6.1 Program Definition and Purpose

The HRSD P3 Department under the Water Quality Division is responsible for investigation and control of industrial and commercial (non-domestic) discharges to the sanitary sewer system. The Pretreatment Program is designed to: 1. prevent the introduction of pollutants into the collection system and treatment plant which may interfere with the plants operation; 2. prevent the introduction of pollutants into the collection system and treatment plant which may pass through or be incompatible; 3. improve opportunities to recycle and reclaim municipal and industrial wastewater, sludge and biosolids; and 4. protect collection system and treatment plant workers.

3.6.2 Goals and Performance Measures

One of HRSD's main objectives is to promote pollution prevention among industries, businesses, and government entities. The primary goal of the P3 Program is to ensure treatment processes and collection systems are not adversely impacted by non-domestic discharges. Performance measures for the P3 Program include:

- Collection system issues determined to be caused by commercial/industrial dischargers.
- Number of industrial inspections.
- Issuance of Notice of Violations (NOV).
- Full Compliance.

Goals		Performance Measures	Target Value
P3 - System Issues determined to be caused by commercial/industrial dischargers	Collection System Issues related to unauthorized materials introduced into the system such as FOG, prohibited chemicals, etc. The annual number of qualifying system issues provides an indication and trend of progress being made to reduce these occurrences.	Number of system issues per month	Monitor trend
P3 - Industrial Inspections	HRSD performs periodic inspections of all regulated industrial dischargers to determine compliance with permit requirements and Industrial Wastewater Discharge Regulations	Number of periodic Industrial Inspections performed per month	Monitor trend
P3 - Notice of Violation	HRSD has the authority to issue NOVs when non-compliance with local or categorical numeric limitations, BMPs or any violation of the IWD Regulations is discovered. The number of NOVs issued provides an indication and trend of compliance.	Number of NOVs issued per month	Monitor trend
P3 - Permitted Compliance	HRSD samples permitted dischargers on a random, unannounced, as well as scheduled, basis with the frequency of sampling based on the category and compliance of the User. HRSD also requires permittee self-monitoring and reporting.	Number of permitted industries recognized for exemplary compliance. No violations – Gold, Platinum or Diamond Award	Monitor trend annually

3.6.3 Program Description / Components

HRSD's Pretreatment Program plays a critical role in HRSD's MOM Program. Its components and contributions are summarized in this section.

3.6.3.1 Industrial User Permitting Program

HRSD's P3 Department is responsible for regulating hundreds of commercial and industrial facilities through enforcement of HRSD's Industrial Wastewater Discharge Regulations. Approximately 160 industrial dischargers (including waste haulers) have been issued discharge permits, which outline applicable effluent limitations, monitoring requirements, metering requirements, and appropriate compliance schedules.

Permit coverage is required by industries at the discretion of the P3 Department. Permit compliance is monitored through unannounced grab sampling, work week sampling surveys, periodic inspections and self-monitoring by the industry. Permit Violations are responded to as outlined in the HRSD P3 Enforcement Response Plan, which is located at the P3 Department office and is available on HRSD's main webpage, www.hrsd.com.

Many types of commercial facilities and smaller industrial users, which include some located within federal facilities, are regulated using the same type of permit program or regulatory controls used for significant industrial users. Examples of these facilities include large laundries; vehicle maintenance facilities (public and private to include radiator shops, etc.); medium and large medical facilities; food processing facilities; centralized waste treatment facilities; tank truck hauling services; and small manufacturing facilities. These small facilities are sometimes ignored by large industrial waste control programs; however, regulation of these facilities has been a key to the success of HRSD's pretreatment program. Although each individual facility represents a small loading to the publicly owned treatment works (POTW), together they can represent a large portion of the toxics received at the plant.

HRSD's local limits were developed and are reviewed periodically to protect the POTW facilities as well as their receiving water bodies. The most important factors used in the determination of limits were biosolids reuse, no opportunity for inhibition (including nitrification), increase opportunities for water reuse/recycle, and discharge of a non-toxic effluent from the plants. This is accomplished using the allowable head works loading method in conjunction with a combination of the uniform concentration limit and the mass proportion allocation methods. HRSD chose these allocation methods because they offer the most flexibility in providing a concentration limit (easy to regulate), yet also provides a more reasonable approach to regulating industries based on pounds of toxic pollutants discharged to the sewer system.

HRSD regulates the following parameters numerically for all direct dischargers to the sanitary sewer system: arsenic, cadmium, total chromium, copper, cyanide, lead, mercury, nickel, phenolic compounds, silver, zinc, pH, non-saponifiable oil and grease (SGT-HEM), total and individual toxic organics, BTEX (benzene, toluene, ethylbenzene, and xylenes) and COD/BOD ratio. The specific limits for these can be found in the HRSD Industrial Wastewater Discharge Regulations which are located at the Pretreatment & Pollution Prevention office and is available on HRSD's main webpage, www.hrsd.com. Most concentration limits are based on flow amounts, where concentration limits decrease as flow increases to control the loading that may enter the POTW. Site specific limits are also developed and enforced as needed depending on specific characteristics of that industry's discharge.

In addition to the numerical limits referenced above, HRSD has prohibited (zero discharge) discharge of a number of very toxic chemicals and pollutants to the HRSD's system. HRSD maintains and updates a list of these chemicals and pollutants as necessary as a supplement to the Industrial Wastewater Discharge Regulations which are located at the Pretreatment & Pollution Prevention (P3) office and on HRSD's website, www.hrsd.com. The list is provided to all industrial users and they are advised of the appropriate discharge prohibitions. Examples of these include Dioxins, Tributyltin (TBT) and Polychlorinated Biphenyls (PCBs).

HRSD's pretreatment program is an integral part of a comprehensive toxics monitoring program. To date, this extensive program has detected no significant adverse environmental impacts and thus validates the effectiveness of the current Industrial Waste Control Program.

3.6.3.2 Inspection and Sampling Program

HRSD samples permitted dischargers on a random, unannounced basis. Inspections are performed regularly with frequency ranging from once or twice per year for Significant Industrial Users and Non-significant Industrial Users. Indirect Permit holders are inspected every other year but are routinely spot checked and sampled on a random, unannounced basis at HRSD treatment plants. Each discharge site is also continuously monitored and digitally recorded by CCTV. Every direct permitted industrial discharger is sampled on a monthly to semi-annual basis, depending on their compliance record and variation of their wastewater discharge characteristics. These sampling events consist of self-monitoring performed by the permit holder, as well as HRSD sampling events. HRSD performs unannounced grab sampling, as well as work week composite sampling. In addition to permitted dischargers, HRSD has also inspected and sampled hundreds of commercial and service facilities, such as food service establishments and automotive dealerships. These facilities are subject to high strength waste surcharge and must comply with the HRSD Industrial Wastewater Discharge Regulations.

3.6.3.3 Enforcement Program

Compliance with HRSD's Industrial Wastewater Discharge Regulations is ensured through the use of an extensive monitoring program (HRSD monitoring of industrial users in conjunction with industrial self-monitoring).

The HRSD P3 Enforcement Response Plan was developed in accordance with Section 601 of HRSD's Industrial Wastewater Discharge Regulations, requirements of HRSD's Virginia Pollution Discharge Elimination System (VPDES) Permit, and in accordance with requirements of the Clean Water Act (40 CFR Part 403.8) (f)(5). The Plan outlines enforcement mechanisms for violations of HRSD's Industrial Wastewater Discharge Regulations. It is based on the Virginia Water Control Board's Compliance Auditing System (CAS) which is used for enforcement of Virginia Water Control law and the VPDES Permit system. The Enforcement Response Plan is kept in electronic and paper copy in P3's main office and is available on HRSD's main webpage, www.hrsd.com.

The Enforcement Response Plan, approved by the DEQ, uses a point system where violations are assessed points in accordance with their severity and frequency as described in the Enforcement Response Plan. Points range from 0.2 to 4.0 points and are totaled for a running 180-day window, and escalating enforcement action is applied based on the point total. Enforcement responses include Problem Notification Form, Non-Compliance Notification Form, Notice of Deficiency, Notice of Violation, Compliance Letter, Show Cause Notice, Civil Penalty and Permit Revocation/Termination of Service. HRSD implemented this system in January 1993. The program provides a financial incentive to the industry to achieve compliance and resulted in an increase in the number of industrial users attaining 100 percent compliance.

The HRSD P3 Department is responsible for regulating industrial and commercial discharges and has implemented the HRSD Industrial Wastewater Discharge Regulations and National Pretreatment standards in 40 CFR 403.5 in US Federal Code of Regulations. These regulations include general and specific effluent limitations and define the discharge permit program. The authority to enforce the Industrial Wastewater Discharge Regulations of HRSD and all applicable State and Federal regulations, including final EPA "pretreatment limitations," is provided in Section 102 of the HRSD Industrial Wastewater Discharge Regulations.

The P3 Department also regulates Infiltration and Inflow (I/I) from Federal Facilities via I/I Orders. Each of these Federal Facilities is required to comply with HRSD's Federal Facility Technical Standards to reduce or eliminate I/I.

3.6.4 Pretreatment Excellence and Pollution Preventions Awards Program

The Pretreatment Excellence and Pollution Preventions Awards Program is designed to recognized perfect permit compliance. Facilities in perfect compliance are recognized with a "Gold" award. Facilities in perfect compliance for five (5) calendar years are recognized with "Platinum" awards and facilities with ten (10) years or more are recognized with "Diamond" awards.

Facilities that are in non-compliance with their Permit or HRSD's Industrial Wastewater Discharge Regulations may be assessed Civil Penalties. Civil Penalty monies are directed to a dedicated Environmental Improvement Fund. This fund is used for the Awards program mentioned above along with other qualifying environmental initiatives.

3.6.5 Training

Training for P3 staff includes an internal training program as well as external Pretreatment Training, when available. The internal training program consists of a variety of training modules provided by HRSD staff with appropriate expertise. External pretreatment training is offered to new hires as well as current staff as- needed. In addition, continuous training is available via webinars, Virginia Water Environment Association (VWEA) conferences, National Association of Clean Water Agencies (NACWA) conferences and EPA training.

3.6.6 Information Management

Permit related correspondence is stored as hardcopy for a minimum of three years, as required by DEQ Permit. In addition, the Pretreatment Information Management System (PIMS) is utilized to manage data associated with the P3 Program.

3.6.7 Resource Management

Employees who serve the P3 Program report to the Director of Pretreatment & Pollution Prevention. Please refer to Appendix A for identification of Water Quality Division staff that is responsible for the execution of this program. In addition, P3 has a fleet of vehicles of various sizes and configurations which are dedicated to sampling and inspection activities, carrying grab and composite sampling equipment, and incident response.

3.6.8 Process for Continuous Improvement

HRSD will continue to review and revise the P3 Program on an as-needed, ongoing basis. To facilitate this, P3 may hold annual planning days where they take a look at the Program and identify areas for improvement. In addition, they plan to improve the pretreatment program through the following actions:

- Continue to work with Localities on FOG and I/I issues.
- Continuing development on internal training program.
- Continue to track performance measures.
- Increase oversight of permitted waste haulers.
- Ensure adequate regulatory oversight for SWIFT facilities.

3.6.9 Implementation Plan

Program Milestone	Description	Time frame
Electronic Cross-Media Electronic Reporting Rule (CROMERR) Reporting	Continue implementation of electronic reporting of industrial self-monitoring reports in compliance with EPA CROMERR.	Within 3 years

3.7 Fats, Oils, and Grease (FOG)

3.7.1 Program Definition and Purpose

The buildup of Fats, Oils, and Greases (FOG) significantly contribute to sanitary sewer blockages and overflows. These problems primarily occur in the gravity systems owned by the cities and counties within the HRSD service area. The majority of the HRSD system is comprised of force mains which are much less affected by FOG deposits. However, since HRSD has the legal authority to control material introduced into the entire system, HRSD currently plays a key role in reducing FOG-related problems by assisting the Localities in their FOG control efforts.

3.7.2 Goals and Performance Measures

HRSD tracks all FOG-related calls for assistance from Localities and maintains a record via a FOG inspection report.

All permitted waste haulers must comply with various discharge and reporting requirements specified in their Indirect Wastewater Discharge Permit. HRSD's Pretreatment & Pollution Prevention (P3) Department also responds to any report from Operations Division staff of treatment plant or interceptor system problems that may be the result of hauled waste discharges. If investigation proves a waste hauler to be the cause of the problem, enforcement will occur in accordance with the HRSD P3 Enforcement Response Plan.

Goals		Performance Measures	Target Value
FOG - Permitted Waste Haulers	To control waste hauled to the HRSD treatment plants that accept hauled waste, HRSD issues Indirect Wastewater Discharge Permits to many waste haulers operating in the region.	Number of loads and gallons of FOG (grease) delivered to HRSD treatment plants per year	Monitor trend

3.7.3 Program Description/Components

HRSD assists the Localities with their FOG control programs. HRSD provides enforcement initiatives to the Localities for food service establishments (FSE) after such Locality has exhausted all enforcement avenues.

The Hampton Roads Planning District Commission (HRPDC), in conjunction with all of the Utility Directors in the area, has established a FOG program to educate people regarding the proper disposal of FOG from residential sources and FSEs.

HRSD supports the HRPDC effort to institute a regional grease initiative. Since 2004, HRSD's Hampton Roads Fats, Oils and Grease (HR FOG) representatives have been involved in the research commissioned by HRPDC to identify the most significant training needs and establishing sizing standards for grease control devices (GCDs). HR FOG has a Regional Training Program for FSE employees and grease haulers that focuses on best management practices for GCD maintenance. Once training is complete, the grease hauler or FSE employee receives a training certification that is valid for three years.

3.7.3.1 Permitting Program

HRSD does not issue permits or other similar control mechanisms specifically for GCDs in Localities covered by this MOM Program. However, some Direct Wastewater Discharge Permits do include GCDs as part of the pretreatment equipment requiring inspection and maintenance (e.g. Federal Facilities).

However, HRSD issues Indirect Wastewater Discharge Permits to all waste haulers that discharge at HRSD treatment plants. HRSD allows these permitted waste haulers to discharge non-industrial wastes at

designated HRSD treatment plants. Permitted wastes include domestic septage, food service GCD waste, collection, holding and transfer (CHT) wastes from vessels, and wastes from portable toilets. All waste haulers that are permitted by HRSD are required to submit a monthly report detailing the customer, quantity collected, date of collection and which HRSD treatment plant the waste was discharged. These hauled wastes are billed in accordance with the current HRSD Rate Schedule for Hauled Wastewater (Indirect Discharge Waste). All indirect discharge trucks are issued HRSD ID cards for the automated septage receiving facilities currently located at five of HRSD's treatment plants with three of those accepting FOG.

3.7.3.2 Inspection Program

The vast majority of facilities with GCDs are commercial FSEs, which are not permitted by HRSD but may be billed for high strength waste surcharge. HRSD also provides assistance to any Locality requesting help with FOG-related problems within the service area. If a Locality is experiencing line blockage or pump station problems as a result of a particular discharger(s), and requests HRSD's assistance, HRSD requires the problem discharger(s) to take corrective actions, using the regulatory authority given to HRSD through the Industrial Wastewater Discharge Regulations.

Permitted waste haulers are spot checked and sampled on a random, unannounced basis at HRSD treatment plant hauled waste discharge sites. Each discharge site is also continuously monitored and digitally recorded by CCTV.

3.7.3.3 Enforcement Program

If a facility has no GCD, or if a GCD is found to be improperly installed, undersized, in need of repair, or improperly maintained, the facility is issued a notice of deficiency and is required to address the problem. A subsequent site inspection is performed to verify that corrective action has been taken. In the event a problem is not properly addressed as required, additional enforcement actions are taken.

All permitted waste haulers must comply with the HRSD Industrial Wastewater Discharge Regulations and all conditions of their Indirect Wastewater Discharge Permit. Any instance of non-compliance is addressed in accordance with the HRSD P3 Enforcement Response Plan.

All permitted waste haulers must submit a monthly report to HRSD recording the type of waste brought to HRSD and the waste source. This information can be used to confirm an FSE's claim of using a permitted waste hauler to dispose of grease.

By virtue of the Enabling Act, HRSD is authorized to gain access to private property to inspect for FOG compliance and to enforce compliance of FOG control requirements. A model FOG ordinance, enforcement guidelines and GCD standards have been developed for Locality use. Legislation has been adopted at the State level to give Localities the ability to use civil penalties to control FOG disposal into the wastewater collection system.

3.7.4 Training

HRSD uses a variety of outreach methods to educate the public about the importance of wastewater treatment and what they can do to help protect area waterways. "Down the Drain" topics, including proper FOG disposal, are stressed in facility tours, school outreach, and participation in community and environmental events. HRSD's social media efforts help deliver our messages to a broad audience. As a member of the askHRgreen.org initiative, we contribute to regional campaigns that focus on wastewater infrastructure awareness and "Down the Drain" messages for the general public. These messages reach a wide audience via the "askHRgreen.org" blog, which HRSD contributes to, as well as through other askHRgreen.org marketing efforts delivered through radio, newspaper, magazine, billboard, theater, and other online/social media avenues.

The HRPDC, in conjunction with all the utility directors in the area, has established a program called HR

FOG to educate people regarding disposal of fats, oils and grease and highlights proper disposal methods. FOG inspections and enforcement activities are conducted by HRSD's P3 Department as needed, and all training at commercial sources is performed on an on-the-job basis.

3.7.5 Information Management

HRSD documents requests for assistance from the Localities served by HRSD via phone logs and FOG inspection reports in the Pretreatment Information Management System (PIMS). When HRSD performs an inspection, a FOG inspection report is generated and maintained in the P3 office.

Each HRSD site that accepts material from permitted waste haulers maintains an electronic database that records the hauler, amount and type of material delivered.

3.7.6 Resource Management

HRSD has P3 Technicians at both the North and South Shore P3 operations centers that perform FOG-related work on an as-needed basis. These personnel are respectively under the direction of the North and South Shore P3 Managers. All P3 Managers report to the Director of Pretreatment & Pollution Prevention, who in turn reports to the Chief of Water Quality. HRSD has a dedicated position, P3 Supervising Specialist, to handle FOG-related enforcement actions when Localities request assistance from HRSD.

Please refer to Appendix A for identification of Water Quality Division staff that is responsible for the execution of this program.

3.7.7 Process for Continuous Improvement

HRSD supports the HRPDC effort to institute a regional grease initiative. Since 2004, HRSD's HR FOG representatives have been involved in the research commissioned by HRPDC to identify the most significant training needs.

3.7.8 Implementation Plan

Implementation of the Locality FOG programs are ongoing and HRSD will continue to assist Localities in that endeavor.

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3.8 Regional Consultation

3.8.1 Program Definition and Purpose

Regional consultation is critical to the shared success of HRSD and the Localities that comprise the Regional Sanitary Sewer System. Initially, HRSD and the Localities were working cooperatively under the terms of the Special Order By Consent (SOC) with the Virginia Department of Environmental Quality (DEQ) to achieve Clean Water Act compliance. HRSD and the Localities, together with the EPA and DEQ, recognized the potential benefits of a regional approach to achieve the goal of eliminating sanitary sewer system overflows, backups, bypasses, and unauthorized discharges. An enhanced regional approach, above and beyond the approach put into place as a result of the SOC, would more effectively and efficiently accomplish the regional goals. Accordingly, HRSD assumed the primary leadership role for regional sewer capacity and entered an amended Consent Decree with the EPA and DEQ to execute a cohesive and regionally beneficial compliance approach.

The relationship between HRSD and the Localities is strong and has evolved from collaboration, prior to and during the SOC term, to consultation with the Localities. HRSD assumed responsibility for developing the required Regional Wet Weather Management Plan and implementing the improvements contained therein. However, the Localities are important to the success of the regional approach and HRSD's consultation with these entities is critical to achieving the regional program goals.

With respect to the MOM program, HRSD and each Locality are responsible for implementing and executing their own MOM programs for the sewer assets they own. HRSD will consult with the Localities toward this end to share ideas, and at times resources, to promote the successful operation of the MOM plans and to reduce overflows, bypasses, backups, and unauthorized discharges in the regional and Locality systems. However, ultimately, each entity is responsible for their respective MOM programs.

3.8.2 Goals and Performance Measures

Goals		Performance Measures	Target Value
Maintain positive relationship with Localities	Meet twice a year with Capacity Team to review/resolve issues	Actual Number of Capacity Team meetings per year	2 per year

3.8.3 Program Description/Components

HRSD works closely with the Localities in its service area on a wide variety of programs. While these points of consultation are numerous and of varying importance, this section provides a brief summary of the major areas of consultation where there is significant interaction between HRSD and the Localities.

3.8.3.1 Wet Weather Operation

During wet weather events, HRSD and Localities will continue to coordinate activities to optimize the operation of the regional sanitary sewer system. This coordination may include sharing of operational data such as pressure, flows, rainfall, pump run times and SSOs. When feasible, the Localities and/or HRSD may modify the operation of their respective systems to enhance the ability to convey peak flows through the system as a whole. These modifications may include such actions as bypass pumping, changing pump settings, operating system valves to divert flows, provision of emergency generators in the event of power outages and other prudent and reasonable steps. Communications will be maintained at the operating levels of the organizations.

3.8.3.2 Flow, Rainfall and Pressure Monitoring

Localities and HRSD are collecting flow, rainfall and pressure information from their respective systems. This information will be made available amongst the entities to promote shared understanding of the

performance of the regional system.

3.8.3.3 SSO Response

HRSD and the Localities have shared their respective SSO Response Plans with one another, as needed. Any updates to these plans will be shared with the other parties. During SSO Response, coordination between HRSD and the Locality occurs, as appropriate. This coordination may take the form of modified operation to mitigate the SSO, joint deployment of resources and communications of system operating conditions as appropriate to the actual circumstances.

When capacity related overflows occur, HRSD and the involved jurisdiction will investigate, share and review Locality and regional system operating data to better understand system performance and to explore whether changes in the operation of existing system infrastructure could be implemented to minimize the probability of SSO occurrence and/or mitigate the SSO. Planned system improvements will also be reviewed.

3.8.3.4 Flow Acceptance

The Region has adopted a flow acceptance process. This process is applicable to requests for new or modified flows to Locality and Regional systems. The process provides for a uniform approach to the review of requests and a defined sequence of review between HRSD, Localities and DEQ. See Section 3.10 for more information on this program.

3.8.3.5 Sewer System Modeling

Regional Hydraulic Models have been developed by HRSD. HRSD maintains the Regional Hydraulic Model.

3.8.3.6 Sanitary Sewer Evaluation Survey (SSES) Planning and Execution

HRSD and each Locality are responsible for conducting SSES work for their systems as outlined in their respective MOM programs. HRSD has identified the Locality owned catchments that will be rehabilitated as part of the High Priority Projects in the RWWMP. HRSD and Localities will share SSES, Rehab Plans and I/I reduction results as work is accomplished in the system.

3.8.3.7 Fats, Oils and Grease (FOG) Control Programs

To reduce fats, oils and grease directly entering the regional sewer system, thereby, reducing the potential for sewer backups and overflows from sewers plugged or compromised by greases and oils, HRSD and the Localities have developed the outline of a regionally consistent FOG control program through the Hampton Roads Planning District Commission (HRPDC). A working group, of which HRSD is an active participant, has prepared several model documents that were considered and have been adopted by several Localities. The major components of the program are:

3.8.3.8 Model Ordinance

A model FOG ordinance was developed with the aid of a national consultant and reviewed by area Utility Directors and local attorneys. The ordinance includes provisions for Grease Control Device (GCD) requirements for new food service establishments (FSEs), as well as retrofits for existing FSEs. Adoption of some or all of the model ordinance is at the discretion of each Locality.

In addition, a training requirement for both grease haulers and FSE employees has been established. Training and certification are delivered online on a regional basis.

3.8.3.9 Model Enforcement Response Plan

The purpose of the Model Enforcement Response Plan is to establish general responsibilities for enforcement of the Model FOG Ordinance.

The Model Enforcement Response Plan was developed to address FOG contributions to the system. Compliance assistance, notice of violation, water and sewer service termination and legal action are all available as enforcement mechanisms. Adoption of some or all of the Model Enforcement Response Plan is at the discretion of each Locality.

3.8.3.10 Grease Control Device (GCD) Design & Sizing

Design and sizing guidelines have been developed by a regional technical committee. Participants gathered field data from local FSEs, consultants, and reputable grease haulers to provide validity to GCD size and maintenance requirements. These design and sizing guidelines are reviewed and updated as needed.

3.8.3.11 Climate Change Planning and Response

The Hampton Roads Planning District Commission (HRPDC) has adopted a range of 3 to 4.5 feet as the planning range for sea level rise (SLR) by 2100 to use in the region. When these SLR projections are combined with the Virginia Institute of Marine Science (VIMS) 100-year flood projections, the Hampton Roads region shows widespread flooding by about 2060. In addition, there are several other climate change scenarios that will also have impacts on HRSD facilities. These include recurrent flooding and extreme storm events (beyond the level of service) which could cause damage to HRSD equipment. HRSD will continue to coordinate with regional partners in regard to climate change adaptation.

3.8.3.12 Memorandum of Agreement (MOA) for RWWMP Implementation

A MOA dated March 10, 2014, and First Amendment to Memorandum Agreement define Locality and HRSD responsibilities under the regionalized approach to the RWWMP. Under this MOA, the Localities agreed to:

1. Maintain and operate their collection systems in accordance with their approved management, operations, and maintenance programs (MOM) and accepted practices.
2. Provide all access to data and assets.
3. Maintain and calibrate Locality flow monitoring equipment.
4. Provide staff and/or consultants to support development and implementation of the RWWMP.
5. Timely issue of Locality permits.
6. Cooperation on implementation of the RWWMP.
7. Provide timely notice of and investigate in cooperation with HRSD, capacity related SSO's.

HRSD agreed to:

1. Develop a reasonably affordable and cost-effective RWWMP in consultation with Localities.
2. Implement the approved RWWMP.
3. Design and construct all RWWMP projects in accordance with HRSD Design and Construction Standards and the applicable portions of the HRPDC Construction Standards.
4. Fully fund implementation of the RWWMP.
5. After completion of the RWWMP and the post-RWWMP performance assessment maintain adequate wet weather capacity in the Regional Sanitary Sewer System.
6. Maintain flow monitoring program in HRSD's system.
7. Investigate in cooperation with Locality capacity related SSOs in the Localities' systems.
8. Provide record drawings for improvements in Localities' systems.
9. Convey RWWMP HRSD-constructed improvements in Localities' systems.
10. Assume regulatory liability for wet weather SSO's upon approval of the Adaptive Regional Plan / RWWMP.

3.8.4 Resource Management

The Planning and Analysis, North Shore Operations, and South Shore Operations Departments are responsible for issues regarding Regional Consultation.

3.8.5 Process for Continuous Improvement

HRSD will continue to consult with the Localities on the various regional programs that are in place and the

development and implementation of the RWWMP. Further, HRSD will execute their MOM plan and consult with the Localities to operate the regional sewer system to minimize overflows, backups, bypasses, and unauthorized discharges.

3.8.6 Implementation Plan

None identified at this time.

3.9 Adaptive Regional Plan Performance Assessment

3.9.1 Program Definition and Purpose

The Adaptive Regional Plan was submitted on June 29, 2020, and approved on February 8, 2022, as the RWWMP and the Fifth Amendment to the Consent Decree. EPA has encouraged the use of adaptive management approaches in a wide variety of settings. Adaptive management features iterative decision making to manage uncertainty in addressing municipal environmental challenges. This approach has been particularly necessary with long-term community sewer rehabilitation and related programs. Almost every such program has needed multiple major modifications. In addition to responding to changing community circumstances, adaptive management also allows communities to continually prioritize the greatest public health and community benefits for the next public dollar invested. Given the scope, cost, complexity, and evolving nature of the challenges which HRSD and the Hampton Roads region face, the RWWMP necessarily features an adaptive management approach.

One of the most significant evolving planning considerations which the Hampton Roads region faces is adaptation to rising sea level and increased frequency of recurrent flooding. The National Oceanic and Atmospheric Administration's Office for Coastal Management has identified Hampton Roads as experiencing the highest rate of sea level rise along the entire Atlantic seaboard and that the region is the second largest population center in the United States at risk due to the impacts of sea level rise. Addressing sea level rise poses enormous challenges for HRSD and all of the Hampton Roads communities. We must balance further investments in regional wet weather capacity with investment in adaptation and resiliency strategies, which will likely necessitate utility relocation and/or floodproofing.

Rising sea levels and the grave implications for Hampton Roads have come into focus over the past decade since EPA began discussions with HRSD about the RWWMP. As frequency, the level and the amount of low-lying lands impacted by sea level rise continue to increase, larger portions of the regional sanitary sewer system are at risk. Traditional capacity management strategies may not be effective or appropriate in these areas and future investments may be needed to develop new systems that can function in areas frequently inundated until a managed infrastructure retreat/resiliency strategy is developed for coastal land.

Additionally, there are a number of other adaptive management factors that create significant uncertainties (and opportunities) about any infrastructure investment plan that spans more than a decade. These uncertainties/opportunities include:

1. The impact of sea level rise and recurrent flooding in the region's infrastructure, land use patterns and economy.
2. Understanding the system response to wet weather capacity-related investments.
3. Magnitude and spatial patterns of community growth and redevelopment.
4. Future of the extensive DoD facilities in the Hampton Roads Region and HRSD priorities regarding these ubiquitous facilities throughout the service area.
5. How effectively Locality and HRSD MOM programs will address sewer system degradation and I/I levels.
6. Regional economic vitality and household income and employment levels.
7. Changing regional environmental and public health priorities, specifically post implementation evaluation of the Chesapeake Bay TMDL after 2025.
8. Changing technologies and opportunities to achieve multiple benefits for public sewer-related investments; and,
9. Levels of federal and state financial support for unfunded environmental mandates across all media.

These uncertainties will have a profound effect on the location, volume, significance, and priority of future wet weather capacity-related overflows. This will particularly be the case for the capacity-related

investments for the period after 2030.

3.9.2 Goals and Performance Measures

The goals of HRSD's Adaptive Regional Plan Performance Assessments are to:

- Confirm Round 2 High Priority Projects are still expected to meet the desired results.
- Check in with EPA/DEQ.
- Provide estimates of the capacity of key components.
- Identify hydraulic deficiencies.
- Submit Performance Assessment to DEQ and EPA by March 31, 2043.

3.9.3 Program Description / Components

The Performance Assessment will utilize available system data (flows, pressures, SSOs, etc.) along with hydrologic and hydraulic modeling. HRSD commits to confirming Round 2 HPP projects with EPA/DEQ by 2030 and submitting the RWWMP Performance Assessment by March 31, 2043.

3.9.4 Resource Management

The Planning and Analysis Division will manage the Performance Assessments.
HRSD will refine the process of capacity assessment periodically as new data and tools become available.

3.9.5 Implementation Plan

None identified at this time.

3.10 Flow Acceptance Process

3.10.1 Program Definition and Purpose

HRSD has developed a refined flow acceptance process for the purpose of reviewing proposed new connections or major modifications to existing connections to the regional sanitary sewer system. This refined process has been in place since 2008 and was revised in 2014. The process allows for the orderly and consistent review of new service requests and coordinates the review process between the Localities, DEQ and HRSD.

3.10.2 Goals and Performance Measures

The goals of the flow acceptance process include but are not limited to the following:

- Coordinate with Development Community on new connections to conform to HRSD Standards.
- Provide a check opportunity for HRSD and DEQ to ensure sewers are designed in accordance with the Regional Design Sewage Flow Projection Data.

Goals		Performance Measures	Target Value
Flow Acceptance	Allow for the review of new service requests in accordance with HRSD Standards	Number of Flow Applications Processed	Trend

3.10.3 Program Description/Components

HRSD has the legal authority to accept and/or reject flows from satellite municipal collection systems by Section 40 of the Enabling Act and by the Sewage Collection and Treatment Regulations. It is HRSD's responsibility to maintain an effective flow acceptance process.

HRSD adopted four key policies associated with Flow Acceptance: Hydraulic Grade Line (HGL) – System Operating Pressure Policy, Regional Sewage Flow Projection Data Policy, Capacity Assurance and Connection Policy, and Service Area Expansion Policy. The HGL policy defines the methodology that HRSD will use in providing interceptor system pressure information to design engineers for new terminal pump station connections and upgrades. The Regional Sewage Flow Projection Data policy provides the standard planning parameters for use in estimating flows associated with new development. The Capacity Assurance and Connection policy supports the sizing and planning of the Regional Interceptor System policy and establishes the process for connecting to the said system. The Service Area Expansion policy establishes the procedures and guidelines to submit, review, and approve service area expansion requests. Flow acceptance will be contingent upon adherence with these policies.

For those projects that do not fall within the HRSD Policies, HRSD will coordinate with the Locality and design engineer to resolve the discrepancies until a Flow Acceptance Letter can be issued.

3.10.4 Training

On-the-job training is provided to the engineers who perform work related to flow acceptance.

3.10.5 Information Management

Flow acceptance applications are processed via the Development Services Work Order Tracking system. Flow Acceptance Letters are issued by HRSD and transmitted via email to the respective Locality.

3.10.6 Resource Management

The Flow Acceptance Program is the responsibility of HRSD's Engineering Division through the Planning and Analysis Department. Please refer to Appendix A for identification of staff that is responsible for the

execution of this program.

3.10.7 Process for Continuous Improvement

HRSD will continue to review and revise the flow acceptance process on an as-needed, ongoing basis with the intent to create business rules and consistency aligned with the policies adopted by the Commission.

3.10.8 Implementation Plan

HRSD will continue the current Flow Acceptance process.

3.11 New Connections

3.11.1 Program Definition and Purpose

The purpose of the New Connections Program is to:

- Prepare accurate and detailed records of new facilities.
- Ensure the contractors who are performing hot taps/wet taps are qualified and approved by HRSD.
- Provide information to Billing Division on new connections.

3.11.2 Goals and Performance Measures

Goals of the New Connections Program are:

- To be aware of new connections.
- Inspect all new connection to make sure they meet HRSD standards.

Goals		Performance Measures	Target Value
New Connections - Inspection	Inspect all new development connections to make sure they meet HRSD standards.	(No. of approved new direct connections inspected per year / No. of new direct connections made to system per year) X 100%	100%

3.11.3 Program Description / Components

The New Connections Program encompasses projects that connect to an existing HRSD valve, projects that require a new tapped connection, or projects with proposed gravity connections. For all three connection types, HRSD maintains control over the new connection process with advance notification to the System Manager required for approval of the connection plans. Compliance with the Virginia 811 procedures is also required. An HRSD-designated inspector is to be present at the connection site and all materials used must be new and meet HRSD standards. Use of the new connection requires HRSD authorization. HRSD will re-inspect all new connections six months after completion and the contractor will be required to correct any deficiencies found.

Additionally, connecting to an existing force main valve requires pressure testing the connection prior to use. Tapping a new connection into a force main requires advance approval of the saddle and tapping valves to be used, and only contractors that are approved may perform line tapping. In-place pressure testing of the saddle and tapping valve according to manufacturer's procedures is required and only HRSD personnel may operate HRSD valves.

Connections to HRSD gravity mains must be made at manholes, and these connections must meet HRSD standards.

These procedures allow HRSD to ensure the connection process is in accordance with HRSD's Standards and other applicable HRSD policies.

3.11.4 Training

On-the-job training is provided for staff that performs this work.

3.11.5 Information Management

Both North Shore and South Shore Operations departments utilize the geographic positioning system (GPS) and digital photographs to locate connections and provide information for inclusion into HRSD's geographic information system (GIS). Both departments also develop standard connection reports to coordinate and track new connections. These reports are stored electronically. The valve guide which is included in the connection report is utilized to insert the location into HRSD's GIS.

3.11.6 Resource Management

Overall management of this program is provided by the Directors of Interceptor Operations. HRSD's Planning & Analysis staff review the plans of all proposed new connections, submitted by Localities, consultants, and contractors, as part of their overall job responsibilities. HRSD has inspector positions that are responsible for viewing the installations and obtaining information necessary to make the detailed valve guide drawings that show the location and types of valves being connected to HRSD's system. There are additional Operations field support staff members that can be pulled in to help as necessary. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

3.11.7 Process for Continuous Improvement

HRSD will continue to review and revise the new connection process on an as-needed, ongoing basis, including:

- Developing connection standards for developers to use as guides for new connections
- Revamping new connection details.
- Standardizing policies for new connections.
- Continuous coordination with HRPDC regarding updates to shared construction documents.

3.11.8 Implementation Plan

Program Milestone	Description	Time Frame
To address abandoned connections	Develop best practices on verifying the integrity of tapping connection at the time of abandonment and address deficiencies, as necessary	June 2025

3.12 Virginia 811 – "Call Before You Dig."

3.12.1 Program Definition and Purpose

HRSD participates in the Virginia 811 program to prevent damage to its underground assets by locating and marking underground lines prior to construction or other excavations that may occur.

3.12.2 Goals and Performance Measures

HRSD has the goal of accurately marking the underground lines to ensure that HRSD facilities are not damaged. HRSD responds to all types of Virginia 811 tickets within the designated time required by the program.

Goals		Performance Measures	Target Value
Prevent damage to underground lines	To prevent damage to underground lines the location of system lines must be marked in a timely manner once a Virginia 811 ticket has been issued.	(No. of Virginia 811 "no shows"/ Total number of tickets received)	0

3.12.3 Program Description / Components

As a utility owner, HRSD is required by the Commonwealth of Virginia to participate in a state-wide Virginia 811 program. Anyone preparing to excavate is required by law to call the State Corporation Commission to have all underground utilities located and marked before digging. The State coordinates the calls and notifies all utilities of possible conflicts. The Virginia Utility Protection Services program has been dubbed "Virginia 811." Virginia 811 issues a ticket depending on the type of job or excavation. The types of tickets are designated as designer, regular, update, emergency, meeting, or special project tickets. HRSD is required to respond to all tickets received and is typically required to mark its utilities within 48-72 hours (or sooner depending on the type of ticket) of the notification. If the project is under design and physical survey of the utilities is needed, then a "designer" ticket may be called and HRSD will have up to 15 working days to mark the utilities in conflict. More detailed information on the requirements and regulations of the Virginia 811 program can be found in Virginia's *Professional Excavator's Manual* prepared by Virginia State Corporation Commission.

HRSD utilizes the Polaris web-based ticketing tool to manage tickets through Virginia 811's on-line system, meetings, and other aspects of this program. HRSD has full-time staff and a contracted company dedicated to performing these activities. The marking crew utilizes record drawings, tracer wire, line of sight and other location technologies to provide the location of the underground utility.

HRSD follows best practices for markings as outlined in the Virginia Underground Utility Marking Standards prepared by Virginia State Corporation Commission. Please refer to this manual for further detail.

3.12.3.1 Enforcement Program

If HRSD is not called and a contractor's crew is seen working in the vicinity of HRSD's facilities, the contractor can be forced to stop working and may be reported to the Virginia State Corporation Commission. If an HRSD line is damaged in the process of performing work that had not been reported to Virginia 811 or was properly marked, the contractor is liable for any repairs to the system. An insurance claim can also be filed to recover repair expenses not assumed by the contractor. Complete and detailed enforcement rules can be reviewed in Virginia's *Professional Excavator Manual.*

3.12.3.2 Line Location for Third Parties

HRSD may own pipes in areas where the Virginia 811 program does not apply, or a contractor may be

working on or near a plant or pump station and request that underground utilities be marked. Upon request, HRSD may mark the utilities in these areas. This service is provided to ensure the integrity of HRSD's pipelines and structures.

3.12.4 Training

On-the-job training is provided for technicians who perform this work.

3.12.5 Information Management

HRSD utilizes the Polaris web-based mapping tool to manage tickets, meetings, and other aspects of this program. The GIS and the Engineering Document Management System drawing system are used as reference sources. GIS access via mobile devices is available to assist in the line marking.

3.12.6 Resource Management

The HRSD Virginia 811 program is operated under the direction of the Directors of Interceptor Systems, who report to the Chief Operating Officer.
The North Shore and South Shore resources used in this program are shown in the organizational charts in Appendix A.

3.12.7 Process for Continuous Improvement

HRSD staff back-reference the actual locations with the HRSD GIS and any significant variations are corrected in GIS. These corrected locations are then uploaded to the VA811 GIS to update the location of our utilities and enhance the notification of future excavation activities in proximity to our infrastructure.

3.12.8 Implementation Plan

None identified at this time.

3.13 Vehicles, Portable Equipment and Tools Management

3.13.1 Program Definition and Purpose

HRSD maintains a wide variety of equipment and tools necessary to support the operations and maintenance of the sanitary sewer system. The equipment and tools are managed by personnel in the Operations Division, which includes the Interceptor Systems Department and Support Systems Department. The Support Systems Department manages the maintenance of vehicle and generator, in addition to the production of the carpentry and machine shops for all HRSD locations.

3.13.2 Goals and Performance Measures

Goals		Performance Measures	Target Value
Fleet Preventive Maintenance	Reliable maintenance of vehicles, mobile construction equipment, and other mobile equipment. This is vital to both normal maintenance efficiency and providing a timely response to system problems.	Each significant piece of equipment has an annual PM routine performed. (# of PM's accomplished / # of annual PM's required) x 100%	95%

3.13.3 Program Description/Components

3.13.3.1 Equipment and Tool Repair and Spare Parts Inventory Management Programs

HRSD does not maintain a centralized warehouse for parts and equipment. Instead, critical spare parts for system and pump station repairs are kept at various operation centers. In addition, many frequently needed parts are kept on maintenance vehicles to eliminate travel time needed to pick up parts. A list of businesses where materials can be purchased with a short lead-time is maintained and available with the operations coordinator. The Computerized Maintenance Management System is used to keep track of parts inventory, including spare parts and other types of equipment required to be kept in HRSD's inventory.

HRSD maintains an adequate inventory of critical replacement parts for the interceptor system in warehouses located at North and South Shore Operations Centers and Nansemond Treatment Plant. Critical replacement parts kept in inventory include:

- Pipe – at least 100 LF of 18" to 54" of replacement pipe that can adapt to frequently encountered diameters for AC, CMP, PCCP, DIP, VC, HDPE, PVC, RCP.
- Transition Fittings (DI to PCCP/RCP) – frequently encountered diameters from 8" to 48."
- Full Circle Clamps – frequently encountered diameters from 12" to 54".
- Couplings/Sleeves – frequently encountered diameters from 12" to 54".
- Tapping Sleeves – frequently encountered diameters from 18" to 54".
- Plugs/Caps – various sizes.
- Inflatable Plugs – various sizes.

HRSD pump stations are designed with inherent redundancy to Class 1 reliability standards. HRSD maintains an inventory of portable pumps to address any delays in the repair to a permanent pump. Appendix C provides a snapshot of the current portable pump deployment. This inventory is dynamic and will change as needs dictate. HRSD has emergency authorization procedures to secure emergency pumping equipment as necessary. Furthermore, HRSD maintains a Machine Shop that can fabricate parts if

necessary.

HRSD contracts with local vendors to provide everyday supplies. A charge card system is used that allows employees in all HRSD divisions to charge supplies against their budget.

Each maintenance group maintains critical replacement parts in their local shops and maintenance vehicles to reduce travel time to remote locations.

3.13.3.2 Vehicle Repair Management Program – Automotive Shop

HRSD maintains automotive shops at the North Shore and South Shore locations. The Automotive group maintains the emergency generators at pump station sites and the fleet of cars, trucks, heavy trucks, trailers, boats, and heavy equipment. The size of the fleet varies somewhat from year to year according to needs. Automotive technicians maintain a unique schedule based on mileage and duty to ensure the safety of the equipment and personnel. They maintain records of maintenance and repair activities performed on the equipment. The Automotive Shop also maintains and/or provides service for the stationary and most of the mobile diesel / Liquid Propane Gas / Natural Gas generators in HRSD.

Automotive technicians perform annual preventive maintenance on the permanently mounted pump station emergency generators as well as the mobile generators larger than 100 kilowatts (kW). Routine maintenance on the permanently mounted emergency generators is the responsibility of Interceptor Department personnel. The preventative maintenance activities and frequencies are identified in the ISPMM and CMMS and are routinely evaluated for effectiveness and efficiency.

Six portable generators are stored at the South Shore location at 1436 Air Rail Avenue, Virginia Beach, VA 23455, and two portable generators are stored at the North Shore location at 2389 G Avenue, Newport News, VA 23602.

3.13.3.3 Electrical/Instrumentation Maintenance

Electrical/instrumentation calibration, preventive maintenance and corrective maintenance are provided by E&I staff. E&I staff is positioned at both the North Shore and South Shore locations.

3.13.3.4 Machine Shop

The Machine Shop provides the ability to overhaul pumps as well as fabricate parts when needed to repair pumps and valves. They are stationed at the main office complex.

3.13.3.5 Carpenter Shop

The Carpenter Shop provides minor structural repairs as well as repairs to door, locks, roofs, etc. They are located on South Shore.

3.13.3.6 Facilities Maintenance

E&I and the Automotive Shop work together on small repair contracts and/or small generator replacement contracts that are not part of a larger contract supported by Engineering. E&I and the Automotive Shop are located on South Shore.

3.13.4 Training

HRSD employees responsible for operations and maintenance complete HRSD's Apprenticeship Program or equivalent program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis.

3.13.5 Information Management

The Computerized Maintenance Management System (CMMS) is utilized to monitor parts inventory, including spare parts and other types of equipment required to be kept in HRSD's inventory. The CMMS also serves to document a significant portion of the maintenance activity. In addition, automotive technicians

maintain records of maintenance and repair activities performed on all vehicles.

3.13.6 Resource Management

The Support Systems Department is led by the Support Systems Manager, who reports to the Chief Operating Officer. There are three maintenance departments which include Automotive, Facilities Maintenance, and the Operations Project Team. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

Vehicle and equipment inventory changes regularly as equipment is added, retired, or replaced. As of May 2024, the Support Systems maintains the following vehicles and equipment:

Table 3-1. Inventory of Vehicles & Equipment in Support Systems Division

Department	Equipment
Automotive Shop – North Shore	1 heavy duty truck, 1 light duty truck, 1 trailer, 1 forklift
Carpenter Shop	1 heavy duty truck
Electrical/Instrumentation– North Shore	29 light duty trucks & vans 3 heavy duty trucks & vans 8 trailers 3 Cars / SUV 1 forklift
Automotive Shop – South Shore	1 medium duty truck 2 light duty truck 1 trailer 1 forklift
Electrical/Instrumentation – South Shore	4 cars/SUVs 1 heavy duty trucks & vans 6 trailers 30 light duty trucks/vans 1 forklift
Machine Shop	1 light duty truck & van 1 forklift
Facilities Maintenance Transportation	4 light duty truck 1 car/SUV 1 trailer 1 light duty truck 7 heavy duty trucks 7 trailers
Operations Project Team	5 light duty trucks

Note: Equipment designation follows Federal Size Regulations for Commercial Motor Vehicles - FHWA (dot.gov)

3.13.7 Process for Continuous Improvement

The Support Systems Department annually reviews its operations and procedures at the crew level, and improvement ideas are collected for evaluation and implementation.

HRSD's ISPMM was updated in June 2023 and is kept internally on HRSD's intranet site. This update reflects revised PM checklists, forms, and schedules. Subsequent reviews will reflect additions or deletions of equipment and revised PM procedures. The manual will be reviewed annually to determine if additional revisions will be needed.

HRSD has implemented a CMMS to track usage, maintenance, & repair efforts. Equipment records will contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and maintenance activities. The updated Preventive Maintenance procedures and schedules from the updated ISPMM have been incorporated into the CMMS. The reporting information obtained from the CMMS will allow for the evaluation of the effectiveness individual PM procedures on specific equipment and the overall MOM Program.

3.13.8 Implementation Plan

Program Milestone	Description	Time Frame
Review and Issue updated version of ISPMM	Revise June 2023 manual to show latest procedures and correct schedules and should be a living document that reflects changes in equipment and knowledge.	At least every 3 years

3.14 Information Management Programs

3.14.1 Program Definition and Purpose

HRSD uses a variety of information management systems and data visualization tools to accomplish its mission. Information management systems support management, planning, operations, and maintenance activities by providing for the storage, retrieval, and analysis of a wide variety of data. The significant systems are outlined in the following sections. Appendix E outlines specific software for each information management system and data visualization tools.

3.14.2 Goals and Performance Measures

Information systems support management, planning, operations, and maintenance activities. The following performance measures are under development:

Goals		Performance Measures	Target Value
Maintain System Mapping	Accurate and up to date system mapping and engineering details are important to maintaining and operating the system.	Provide timely update of system changes by revising engineering drawings and GIS information. Number of changes recorded within 30 days when information is submitted / Number of changes submitted to engineering	100%
Maintain CMMS	Accurate and up to date asset registry are important to maintaining and operating the system.	Provide timely update of asset information. Number of changes recorded within 30 days when information is submitted / Number of changes submitted to engineering	100%

3.14.3 Program Description / Components

3.14.3.1 Asset Management Databases

3.14.3.1.1 Geographic Information Systems (GIS)

In an effort to bring added value to the way it conducts business, HRSD developed a Geographic Information System (GIS).

The GIS provides an inventory of the interceptor system consisting of force mains, gravity mains, pump stations, pressure control valves, air release valves, isolation valves and other appurtenances. The interceptor system is kept up to date with new construction, repairs, relocations, and other system changes. Other data elements are also being actively collected to support different business processes. These include 'process-support' data elements such as HRSD customer locations; and 'operational-support' data elements such as valve operating details.

As the GIS evolves, HRSD continues to develop and deploy software applications to support HRSD business functions. In this regard, desktop applications, web browser-based applications and mobile applications have been deployed. These include general informational applications, as well as more elaborate applications supporting hydraulic modeling, data analysis and operational support capabilities. Mobile GIS applications to support field personnel have been deployed to both provide information to field personnel where/when they need it, as well as to facilitate the immediate capture of some asset maintenance activities in the field. The GIS has also been integrated with other information systems at HRSD, such as the Pretreatment Information Management System (PIMS), Laboratory Information Management System (LIMS), Computerized Maintenance Management System (CMMS), and the real-time and historical sensor/monitoring information systems.

GIS tools are used to calculate the likelihood and consequences of failure of linear assets in the interceptor

system based on proximity to waterways and other sensitive sites, failure history, soil characteristics.

3.14.3.1.2 Pretreatment Information Management System (PIMS)

A pretreatment information management system (PIMS) is utilized by the Pretreatment & Pollution Prevention (P3) Department to manage the industrial waste control program. PIMS is the core pretreatment database that provides storage of industrial and commercial facility information, permitting, inspection, sampling, compliance, enforcement, and surcharge billing information. PIMS also provides standard reports and ad-hoc reporting capability.

PIMS is integrated with HRSD's Laboratory Information Management System (LIMS) to schedule sampling tasks and to receive analytical results. iPACS is also integrated with HRSD's Customer Care & Billing (CC&B) system for metering and surcharge, the Geographical Information System (GIS) for mapping and the Carlton Truck Scale System for waste hauler vehicle access and discharge information.

The PIMS core system has sub-modules to facilitate field activities and to allow electronic submission of industrial self-monitoring reports. The field activities module is a mobile system for field inspections and sampling and can be operated on a tablet or laptop allowing direct data entry in the field and then automatically synching to PIMS when an internet connection is available. GovOnline is a secure internet-based application that allows industrial users to submit self-monitoring reports. GovOnline is integrated with PIMS where PIMS sends reporting requirements to GovOnline and receives industrial user submission data back from the system.

3.14.3.1.3 Operations Data Management System (ODMS)

The treatment plants collect thousands of operating data points each week for good operational management of the wastewater treatment system. The purpose of the ODMS is to manage treatment plant specific data and to transfer aggregate data to LIMS to be stored in a long-term, secure, distributed environment for the generation of a variety of reports.

Daily Plant Operations Reports (DPOR) are legal documents verifying the daily operation of the treatment plant. HRSD is responsible for maintaining these documents for state, federal and public review. The DPOR portion of the ODMS allows the plants to properly record and manage their operations on a day-to-day basis. The ODMS transfers data that is required to generate Discharge Monitoring Reports (DMRs) and Monthly Plant Operations Reports (MPORs) to LIMS.

The ODMS is an enterprise system, with data for all plants stored on a central server. The plant operations log for each facility is held in a dedicated database and provides legal documentation of all daily operational data and bench testing data. HRSD is responsible for maintaining these databases, for state, federal and public review. While the ODMS software provides reporting and trending components, the LIMS application database is considered the "System of Record" and stores daily aggregate data for legal and reporting purposes.

3.14.3.1.4 Laboratory Information Management System (LIMS)

The Central Environmental Laboratory (CEL) LIMS is part of HRSD's integrated, interdepartmental information management systems. ODMS and the Pretreatment Information Management System (PIMS) comprise the remainder of these systems. LIMS provides storage for more than a quarter million laboratory results annually as well as treatment plant operational data that is used to create reports. The data are used for regulatory and operational purposes by several HRSD divisions and departments. LIMS is designed to follow applicable US EPA protocols, VELAP requirements and good automated practices for sample and data management. The CEL uses LIMS for many aspects of data and sample management. LIMS functions include automated generation of analytical requests and sample labels, sample receipt, electronic chain-of- custodies, instrument interfaces, data storage, data validation and approval, generation of data reports, and quality control and data storage. The system serves a tool to maintain reagent and standard traceability and tracking of analyst demonstration of capability.

LIMS outputs data into Monthly Plant Operating Reports (MPOR)and transfers data to EDS for research and trending purposes. Hourly data generated at each facility is recorded and used to perform flow and process calculations. LIMS serves as a permanent repository of data for historical purposes and for cross plant reporting. In addition, it ensures the quality and completeness of collected information. Data also are automatically transferred from LIMS to PIMS. PIMS provides a comprehensive database that stores industrial and commercial facility information as well as the wastewater volume and pollutant concentration of industrial discharges.

LIMS is the system of record for all data needed to generate SWIFT Customized reports, MPORs and DMRs. DPOR data transferred from ODMS to LIMS is integrated into the MPORs. The MPORs compile both DPOR data collected by treatment plants and laboratory analytical data collected by the CEL. The MPOR data is ultimately organized into both electronic DMRs (e-DMR) for regulatory reporting to the Virginia DEQ, Yearly Plant Operating Reports (YPORs) for yearly budget and operational assessments and other customized reports as requested.

3.14.3.1.5 Computerized Maintenance Management System (CMMS)

HRSD uses a computerized maintenance management system (CMMS) that contains the following:

- Asset registry.
- Process and asset hierarchy.
- Asset attribute data.
- Maintenance history.
- Replacement and repair parts for assets.
- Preventive maintenance and inspection schedules.
- Detailed maintenance activities.
- Asset reliability and life cycle costs.

CMMS assigns a unique number to each asset, which is used as the basis for tracking the asset throughout its life cycle. Each asset is associated with a core set of data attributes that are standard across all asset types or asset classes. Core asset data attributes include asset class, criticality, installed date, serial number, manufacturer, model, etc. Additional and specific data attributes are associated with each asset based on the asset class. For example, assets identified with an asset class of 'pump' could contain an additional 40 data attributes for tracking pump related information such as, capacity, pump size, impeller diameter, etc. Each asset class has a defined list of the appropriate additional data attributes.

Work orders are used to track all maintenance activities for assets. The complete maintenance history can be viewed on the History tab for each asset. From the History tab, system users can link to each, and every work order associated with the asset. The work order contains the details of who performed the maintenance, when the work was performed, how long the maintenance activity took, the parts used in the maintenance activity (if applicable), what maintenance procedure was followed, total cost of maintenance, and any comments provided by maintenance personnel.

HRSD has defined preventive maintenance (PM) schedules for all assets. These schedules identify the asset, the due date, the frequency, estimated time required, and personnel required to perform the PM or inspection. Each PM schedule is also associated with detailed maintenance procedures or task instructions. The task instructions include safety precautions, tools, parts, materials, test equipment, along with step-by- step procedures for completing the maintenance activity.

CMMS records and keeps track of maintenance records, provides information to assist staff in determining what activities need to be taken in response to problems, and identifies normal maintenance and schedule maintenance to be done. Spare parts inventory management is also maintained within CMMS.

The GIS pushes information about Interceptor System assets into the CMMS. HRSD then uses the CMMS to generate work orders pertaining to assets in the Interceptor system. The connectivity between these databases allows the CMMS to have the latest inventory of pipeline and appurtenance data by adding new assets installed or withdrawing abandoned assets. HRSD maintenance workers have mobile devices in their trucks to be able to electronically download information, forms and drawings, as well as input what maintenance activities are performed from the field.

Goals of the CMMS are:

- Reliability - Increase equipment reliability by performing planned maintenance and reducing corrective (emergency and unplanned) maintenance.
- Downtime - Reduce equipment breakdowns and failures and reduce need for repairs or replacements.
- Management - Provide a convenient and flexible tool for management of maintenance.
- Planning - Promote the efficient scheduling of maintenance.
- Scheduling - Promote balanced workloads and job rotation of maintenance personnel.
- Records - Provide records containing the operating and maintenance history of the equipment.
- Training - Promote personnel training by using written instructions and procedures when performing maintenance.
- Safety - Promote safety by following procedures for maintaining equipment and by familiarizing personnel with safety hazards encountered.
- Costs - Reduce costs by utilizing personnel, material, chemicals and time more efficiently.

3.14.3.1.6 Replacement Planning Model (RPM)

The RPM is a financial planning tool that uses asset inventory information and asset useful life estimates to forecast long term refurbishment and replacement (R&R) requirements. For each asset class, an expected useful life is assigned along with replacement cost functions and applicable refurbishment cycles. For instance, a pump may have a useful life of 15 years with a major refurbishment cycle at 7 years consisting of a major rebuild. The RPM uses the asset class information along with installation dates to develop R&R estimates by asset class and then sums those transactions to arrive at a forecast of R&R requirements by year. This forward-looking projection is used to inform HRSD's capital plan. Specific projects will be identified through operational analyses and condition assessment data. Business Intelligence (BI) dashboards are used to pull information from the various systems and calculate asset remaining useful life to forecast aging infrastructure improvements.

3.14.3.1.7 Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) is an enterprise-wide integrated and comprehensive resource planning system that encompasses multiple modules and business applications that allows HRSD to manage and automate processes for day-to-day business operations. Subsequently, ERP affords management the opportunity to utilize captured and reported data in order to support informative decision making. HRSD's ERP footprint includes:

- Accounts Payable
- Business Intelligence
- Financials
- Human Capital Management
- Payroll
- Procurement
- Projects & Grants
- Sourcing

The budgeting module for CIP and operating budgets within ERP and is designed for users to accurately forecast costs for personnel, fringe benefits, utilities, chemicals, and other expenses on an annual basis. Hyperion also provides the Operations Division the ability to project costs on a quarterly basis during each fiscal year.

Performance measures include the timely interface of monthly activity for projections and budget modules and accurate calculations for personnel and fringe benefit costs.

3.14.3.1.8 Data Analysis Tools

The Data Analysis Section uses a variety of software to validate data as part of HRSD's Flow, Pressure, and Rainfall (FPR) Program. The quality control (QC) and validation of the FPR data plays a critical role for continued modeling in the Regional Hydraulic Model. HRSD's Data historians plays a crucial role in collecting and storing time-series data related to HRSD operations.

In an effort to bring added value to the way HRSD conducts business, HRSD's Data Analysis Section (DAS) has created dashboards, meaningful displays, and reports which allows a user to view their data quickly and efficiently. HRSD has a suite of data visualization tools throughout the organization which allow users to efficiently view data in an effort to gain insights and bring added value to the way HRSD conducts business.

3.14.3.1.9 Project Management Information System

HRSD uses a Project Management Information System (PMIS) for all capital project management, documentation, and cost approvals. The PMIS is a cloud-hosted application The PMIS is used by internal HRSD staff as well as consultant engineers, inspectors, and contractors that work on HRSD project implementation. Business processes that are built within the PMIS dictate to the project management team where documents are entered into the system and automatically routes documentation through the proper approval channels. The system is highly auditable and upon project completion serves as the historical record for HRSD's capital program. Financial information associated with capital projects is interfaced into the ERP from the PMIS. The performance of the PMIS is monitored and maintained by the Business Intelligence Group.

3.14.3.1.10 Hydraulic Modeling

The Regional Hydraulic Model (RHM) was built from HRSD GIS data and selected portions of the Locality's GIS. The model is updated yearly with facility and flow data supplied from the Localities. The model is used to provide dry and wet weather conditions to the Localities in order to properly size any new connections to the HRSD Interceptor System as well as modifications to the existing Locality pump stations. The RHM is also used to size HRSD infrastructure as part of the CIP process, to assist the Design and Construction division during construction of facilities, and to assist Operations in diversion strategies.

3.14.3.1.11 Intranet

HRSD's intranet is primarily used to share information throughout the organization and provides easy access to forms, guidelines, reference materials and other pertinent information. Individual divisions use HRSD's intranet to share information which pertains to their work center via private sites, which are only accessible to the employees that make up that work group. HRSD's intranet is also used to collaborate with outside organizations via team sites. Team sites consist of both internal and external users. External users only have access to an individual team site, they are unable to access the rest of HRSD's intranet.

HRSD's intranet is governed which is responsible for outlining administration, maintenance, and support of the HRSD's intranet environment. Each team member acts as Site Administrator for their respective divisional site. The team defines ownership of departmental sub-sites and individuals who are responsible for those areas of the system. Furthermore, the team establishes rules for appropriate usage of the HRSD's intranet environment.

3.14.3.1.12 MOM Program Measures

HRSD tracks ongoing progress towards its MOM Program across the organization in the HRSD's intranet environment described above. Key HRSD personnel are responsible for inputting monthly data into the MOM tracking system. Key performance indicators are tracked within the system, and overall system performance is reviewed by the MOM Program Steering Committee on an annual basis.

An annual review of the system data is also performed, and any measures that fell short of their targets are addressed in the MOM Annual Report. Six of these measures carry stipulated penalties as defined by the Consent Decree.

3.14.3.1.13 Operational Technical Information System (OTIS)

The Operations Technical Information System (OTIS) is a collection of intranet sites that serve as electronic Operation & Maintenance manuals for the individual treatment and interceptor facilities. The primary function of OTIS is to satisfy regulatory requirements to maintain such a comprehensive reference. The scope of content includes facility design, process function and troubleshooting, training guides, and other technical material related to operation and maintenance of HRSD facilities. Process summaries and operating procedures are typically written directly into the webpages of treatment plant and interceptor OTIS sites. Hyperlinks connect users to appended content, overarching administrative policies, and maintenance-related databases (CMMS). OTIS content is selectively printed for submission to regulatory authorities during permit application or compliance verification.

OTIS is built into HRSD's intranet platform but organized separately from the non-technical administrative material. The system is intended as a contemporary reference and has no archival function. Site content is managed by the respective work centers within the Operations Department and accessible to all personnel with positions related to operation, maintenance, planning, or compliance.

3.14.3.1.14 Customer Information Systems (CIS)

HRSD Customer Care Center utilizes Customer Care and Billing (CC&B) system. CC&B is a complete billing and customer care application designed specifically for utilities. CC&B handles all aspects of the customer lifecycle, from service connection, meter reading, billing, payments, and collections to field work.

3.14.3.1.15 Fleet Management System

HRSD Support Systems Department of the Operations Division uses Fleetistics to manage the fleet assets including crew trucks, heavy machinery, Vactor trucks, passenger vehicles, etc. Fleetistics is a cloud-based system that tracks mileage, engine runtime, speed, and location in real time. Fleetistics is available for HRSD Divisions with a group or groups of vehicles that respond to work required in the field or emergency response.

3.14.3.1.16 Engineering Document Management System

The Engineering Division manages construction and other facilities drawings in a document management system called Adept, by Synergis Software. The system is available to both internal HRSD staff as well as to external partners.

3.14.3.1.17 Building Information Modeling (BIM)

HRSD incorporated BIM requirements in the Design and Construction Standards for all vertical infrastructure projects. BIM is a 3-dimensional graphical representation with associated attribute data of the elements that compose a facility, as well as the configurations required to produce 2-dimensional plan sheets.

3.14.4 Training

Classroom and virtual training are provided periodically for various Information Management Systems. Training manuals for these systems are also loaded for viewing on HRSD's intranet site.
GIS and CMMS training are offered through the Apprenticeship Program and in-house as required.
Software and hardware training is offered by the system administrator/technical expert on an as-required basis for those who need it.

3.14.5 Information Management

HRSD utilizes advanced server technology to maintain a reliable and efficient network. Servers, software, and computer upgrades are continuously being evaluated to keep up with current technology.

3.14.6 Resource Management

The Information Technology Division has three departments: Enterprise Data Services, Information Technology Operations and Support, and Cybersecurity that report to the Chief Information Officer. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

3.14.7 Process for Continuous Improvement

The goal is to update RPM to include risk and condition criteria along with age, material, and replacement cost information.

3.14.8 Implementation Plan

None identified at this time.

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3.15 Capital Improvement Program

3.15.1 Program Definition and Purpose

The capital planning process is a cross-divisional effort. The annual update of the capital plan is facilitated by the Finance Division, while project-level information such as cost, and schedule is developed by the requesting departments. The Engineering and Finance Divisions work together to prioritize and forecast capital project needs.

The HRSD Finance Division is charged with planning and managing the PMIS used to execute HRSD's Capital Improvement Program (CIP) as well as balancing the budget. The Engineering Division is charged with initiating asset replacement projects and executing HRSD's CIP. The CIP includes improvements to existing infrastructure, adding to existing infrastructure, and creating new infrastructure assets to provide service to the HRSD customer base and to protect environmental resources in the Hampton Roads area and beyond.

The first principal CIP function of the Finance Division is reviewing proposed projects. This effort includes helping to determine the need for and the extent, scope, and cost of individual capital improvement projects. Needed projects are then prioritized and an annual CIP is developed for recommendation to the HRSD Commission. The Capital Finance Department within the Finance Division leads the effort for carrying out this planning function.
This section of the document describes in more detail, the capital improvement projects planning functions performed by HRSD through its Finance Division.

3.15.2 Goals and Performance Measures

The goals of HRSD's annual CIP update are:

- Prepare reports and supporting documentation to define and justify each potential capital project.
- Develop, along with all HRSD Divisions, a list of capital improvement projects to be considered for implementation by HRSD.
- Create a prioritized CIP based on screening the list of potential capital improvement projects through a comprehensive set of risk criteria to support capital planning and spending.
- Prepare financial information including capital, operations, and maintenance cost estimates in concert with the Operations and Engineering Divisions for incorporation into the CIP and for use in determining CIP funding.

3.15.3 Program Description / Components

HRSD's CIP planning is managed by the Capital Finance Department. Internal planning studies and facility sizing are performed through the Hydraulic Analysis Review Team (HART) process. Capital improvement projects are planned based on available system data, hydraulic and other technical analyses, as well as forecasted demands for expanded and/or increased service.
HRSD capital improvement projects that move beyond a planned status into implementation are managed through a design and construction program described in Section 3.16 of this document.

3.15.4 Training

An annual training on the CIP update process is conducted by the Capital Finance Department. This training covers all aspects of CIP development, submission in the Hyperion budget application, and a full overview of the capital program approval process. Additional one-on-one training is conducted as needed for individuals new to the organization or new to the capital planning process.

3.15.5 Information Management

CIP planning is managed using a project management information system. Additional information used for

this planning function is maintained by the various sections of HRSD in its GIS, RHM, CMMS, and CAD systems. The Finance, Engineering, and Operations Divisions manage the information contained in these databases by regularly updating them with new information and revising outdated information. Microsoft PowerBI is used to compile information from the various systems into an enterprise Asset Management Plan (AMP), Replacement Planning Model (RPM) for aging infrastructure, and Capital Optimization Model to balance the funding and infrastructure needs.

Once the Design and Construction Department of the Engineering Division completes projects, staff enters and maintains appropriate asset information in the databases that it manages. Project information is accessible through the HRSD's (PMIS). The Chief Engineer is primarily responsible for maintaining the GIS/CAD/BIM records and this function is executed by the Planning and Analysis Department while the CMMS is maintained by the Asset Management Department.

3.15.6 Resource Management

Employees who are part of the Capital Finance Department are overseen by the Chief Financial Officer. Responsibilities for aspects of this program are divided among the sections of this division.

Please refer to Appendix A for the identification of staff that is responsible for the planning and execution of this program.

3.15.7 Process for Continuous Improvement

The Capital Finance Department will continue to review and revise the CIP planning process and tools with the intent to ensure the right projects are being planned for the right time, and to improve the accuracy and consistency of cost, schedule, and risk estimating. An early review will allow for more defined CIP projects to enter the CIP program resulting in a decrease in budget and schedule differential from inception to completion of a CIP project.

HRSD is currently evaluating a Project Management Office (PMO) to assist HRSD with improving processes to better manage the ever-growing CIP.

3.15.8 Implementation Plan

None at this time.

3.16 Capital Projects Design and Construction

3.16.1 Program Definition and Purpose

The HRSD Engineering Division is responsible for ensuring that new or improved HRSD infrastructure is designed in accordance with applicable standards, codes, and guidelines, and is inspected and built to the specified standards. The Engineering Division also provides planning services for the Capital Improvement Program (CIP) and maintains HRSD's GIS system as discussed in Section 3.15 of this document. The purpose of this section is to describe in more detail the design and construction responsibilities by the Engineering Division. The Design and Construction Departments, North Shore, South Shore, Special Projects, and SWIFT, within the Engineering Division lead the effort for carrying out these functions. Figure 3-1 below is a diagram of the support cycle for all divisions under the Engineering Division.

Figure 3-1. Diagram of the support cycle for all divisions under the Engineering Department

3.16.2 Goals and Performance Measures

The goals of HRSD's Capital Projects Design and Construction Program are:

- Ensure environmental reviews and regulatory approvals are secured as required to allow for the design and construction of prioritized capital projects.
- Deliver the projects in a cost-effective and timely fashion that also balances quality and sustainability.

Goals		Performance Measures	Target Value
Engineering - CIP Planning	Deliver CIP projects in a cost-effective manner. Projects that are more or less than 25% of planned budget are often problematic.	Track potential problem projects that are more/less than 25% of their original budgeted amount tracked on a quarterly basis.	Monitor Trend
Engineering - CIP Planning	Deliver CIP projects in a timely fashion. Projects that are more or less than 25% of the planned schedule are often problematic.	Track potential problem projects that are more/less than 25% of their original scheduled completion date tracked on a quarterly basis.	Monitor Trend
Engineering – Standards and Guidelines	Maintain updated *Engineering Division Guidelines Manual and HRSD Design and Construction Standards Manual*	No. of reviews and/or updates in accordance with newly published standards or "Lessons Learned	1 per year

3.16.3 Program Description / Components

The Engineering Division provides standards for the installation of new sewers, pumps, and other appurtenances, and rehabilitation and repairs by publishing a yearly update of the HRSD Design and Construction Standards. The Virginia Sewage Collection and Treatment (SCAT) Regulations are also used as a design standard. The Hampton Roads Planning District Commission's Regional Construction Standards (RCS) is a supplement to the HRSD Standards. Localities typically use the HRPDC RCS along with their Special Provisions for most of their linear projects.

HRSD's CIP projects are normally supervised and inspected through a contractual arrangement with the design engineer, other professional services firm or under the on-call Construction Inspection services contract. As part of the plans and specifications for new projects, strict procedures for testing the facilities are implemented and overseen by the design engineer, HRSD engineering staff, project manager, and the inspector.

HRSD has the authority to ensure the proper installation, testing, and inspection of new and rehabilitated sewers in all parts of the overall system. Section 40 of the HRSD Commission Enabling Act states that the Commission has the right to inspect all new construction and refuse service to any new sewer extension or improvement that would result in injury to the sewerage system. HRSD inspects connections to its system.

3.16.4 Training

HRSD Engineering Division hires persons qualified by education and experience for positions in the Engineering Division. A specific orientation program is created for each new hire based on the individual's background and HRSD duties. Additionally, an individual mentoring plan is developed for each new Project Manager in the Design and Construction Departments. The Engineering Division Guidelines Manual is also used as a training reference.

Funds are budgeted to pay for employees to obtain continuing education credits by attending work-related training which may include industry conferences and seminars.

3.16.5 Information Management

Two HRSD documents provide the basis for the Engineering Division project procedures and design standards: Engineering Division Guidelines Manual and the HRSD Design and Construction Standards. These documents are the responsibility of the Chief Engineer. The HRSD Design and Construction Standards are available on HRSD's public website, www.hrsd.com. The Engineering Department Guidelines Manual is maintained on HRSD's intranet site.

HRSD keeps construction-related drawings for existing plant, pump station, pipeline, and administration facilities in electronic format, and copies can be requested on HRSD's public website, www.hrsd.com. The Chief Engineer is responsible for maintaining these records.

HRSD has adopted widespread use of 3D design and Building Information Modeling (BIM), especially for vertical construction. This technology improves design, minimizes construction conflicts, and facilitates the transfer of asset data into Asset Management (AM) systems for new assets.

Once projects are completed by the Engineering Division, appropriate documentation is maintained in Unifier, the Engineering Document Management system, and the Asset Management database.

3.16.6 Resource Management

The Design and Construction staff members are deployed into four departments: North Shore Design and Construction, South Shore Design and Construction, Special Projects, and SWIFT. There is a director for each division.

Engineering consultant firms are used extensively for study, design, and construction administration of capital projects and contractor FTEs perform construction work under the direction of the Engineering Division.

A number of compliance-related projects are currently being implemented, and HRSD staffing levels will be

evaluated to determine if permanent augmentation is needed.
Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

3.16.7 Process for Continuous Improvement

Upon completion of capital projects, HRSD provides feedback to both consultants and contractors based on safety, performance, schedule compliance, and rules compliance. This process provides a means of improving performance on subsequent projects and identifying deficient performers.

The Design and Construction Standards Committees within HRSD provides improvements to standards based on experience and technology developments. The Standards committees and subcommittees are made up of members from the Operations Division departments as well as representatives from the Engineering Division and the Information Technology Division. The Design and Construction Standards committee proposes and evaluates improvements in the HRSD Design and Construction Standards document.

The Engineering Division, in consultation with the Operations Division, periodically evaluates the feasibility and cost-effectiveness of providing operational flexibility and access points for internal inspection.
The Finance Division's Capital Finance Department maintains a prioritized list of proposed capital projects for use in capital program planning. Each project is given a priority based on uniform criteria. The list is reviewed annually.

Master Specifications have been developed for frequently used equipment and materials on typical projects to save the development of individual specs for each time the equipment is purchased. This minimizes errors of understanding between the design consultant and construction contractor.

The Capital Finance Department will continue to review and revise the Capital Projects Planning process and tools with the intent to ensure the right projects are being planned for the right time, and to improve the accuracy and consistency of cost, schedule, and risk estimating. HRSD has begun using a conceptual project development process for specific needs to provide early screening and review. This allows more defined CIP projects to enter the CIP program resulting in a decrease in budget and schedule differential from inception to completion of a CIP project.

3.16.8 Implementation Plan

Program Milestone	Description	Time Frame
Project Management Office	HRSD is currently evaluating a Project Management Office (PMO) to assist HRSD with improving processes to better manage the ever-growing CIP.	Within 1 year

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3.17 Legal Authority

3.17.1 Program Definition and Purpose

The purpose of Legal Authority is to provide appropriate legal guidance to support the management, operations, and maintenance of HRSD. HRSD, through its enabling legislation, has the legal authority to maintain agreements with Localities, minimize potential reportable SSOs, and implement the various facets of the MOM Program. Specifically, the Enabling Act (§45 of Chapter 66 of the Act of Assembly of 1960 as amended by Chapter 520 of the Acts of Assembly of 1964) authorizes and empowers HRSD to:

- Adopt bylaws and to make rules and regulations.
- Adopt an official seal.
- Sue and be sued.
- Construct, improve, extend, reconstruct, maintain, equip, repair, and operate sewage disposal systems.
- Issue revenue bonds, notes, or other obligations of the District for any authorized purpose.
- Acquire lands, structures, property, rights of way, easements, franchises, or other interests.
- Employ engineers, attorneys, accountants, construction experts, financial experts, managers and other officers, employees, and agents.
- Exercise jurisdiction, control and supervision over any sewage disposal system operated or maintained by the District and to make and enforce such rules and regulations for the maintenance and operation of such system.
- Enter upon any land, water, or premises to make surveys, borings, soundings, or examinations.
- Construct and operate trunk, intercepting or outlet sewers, sewer mains, laterals, conduits, or pipelines.
- Restrain, enjoin or otherwise prevent any county, city town or political subdivision and any person, or corporation from discharging into any waters within the District, any sewage, industrial waste or other refuse which would contribute or tend to contribute to pollution.
- Use and connect with any sewage disposal system and, if deemed necessary, to close off or seal any outlets or outfalls there from.
- Enter into contracts with the United States of America or with any county, city, town or political subdivision or any sanitary district, private corporation, association, or individual providing for or relating to the treatment and disposal of sewage.
- Receive and accept grants or aid for the planning, construction, or financing of any sewage disposal system.
- Make and enter into all contracts and agreements necessary or incidental to the performance of its duties.
- Seek civil penalties against owners who have been charged with violation of or found to be in violation of the pretreatment standards.

3.17.2 Goals and Performance Measures

The goals of HRSD's Legal Support Programs are to:

- Provide legal authority to support operations and minimize SSOs.
- Provide legal authority to manage connections to the system.

- Provide legal authority for pretreatment of industrial discharges, regulation of waste haulers, etc.
- Provide legal authority to control peak flows in the system.

3.17.3 Program Description/Components

3.17.3.1 Inter-Jurisdictional Agreement Program

HRSD was established by the Virginia General Assembly through enabling legislation. All localities must petition the circuit court to become a member of HRSD. Once a municipality becomes a member of HRSD, they must follow HRSD policies in order to connect to the HRSD system.

3.17.3.2 Service Laterals Legal Support Program

HRSD does not own or does not maintain service laterals in the Hampton Roads metro area covered in this MOM Program. The laterals within the public right of way are controlled by the Locality in which they are located. Private property owners own and maintain the laterals on private property.

3.17.3.3 Pretreatment Legal Support Program - P3

The HRSD Pretreatment & Pollution Prevention Department (P3) is responsible for regulating industrial and commercial discharges through application of the HRSD Industrial Wastewater Discharge Regulations and National Pretreatment standards in 40 CFR 403 in US Federal Code of Regulations. These regulations include general and specific effluent limitations and define the discharge permit program. The authority to enforce the Industrial Wastewater Discharge Regulations of HRSD and all applicable State and Federal regulations, including final EPA "pretreatment limitations," is provided in Section 102 of the HRSD Industrial Wastewater Discharge Regulations.

3.17.3.4 Waste Haulers Legal Support Program – P3

Waste haulers handling residential septage, food service grease control device wastes, portable toilets, shipboard domestic (CHT tanks) and other specific wastewaters are authorized and regulated by HRSD in accordance with Section 305 of the HRSD Industrial Wastewater Discharge Regulations, Discharge of Hauled Wastes. The Virginia Department of Health (VDH) typically does not issue a VDH permit to haulers in the region unless the hauler has an HRSD Indirect Permit.

3.17.3.5 Grease Control Legal Support Program – P3

Section 301 D of the HRSD Industrial Wastewater Discharge Regulations prohibits "Any solids or viscous substances that may cause obstruction to flow or be detrimental to sewerage system operations." Section 301 G prohibits "Any petroleum or mineral-based oils and/or any animal or vegetable-based fats, oils or greases, which in excess concentrations would tend to cause interference, pass-through, or adverse effects on the sewerage system, as determined by HRSD."

3.17.3.6 Infiltration and Inflow Control

Section 40 of the Enabling Act prohibits the discharge of anything that may be injurious or deleterious to the sewer system. Further, this section also prohibits the introduction of excessive ground or surface water to the system. An I/I Program focusing on Federal Facilities has been implemented by the P3 Department using I/I Orders. Federal Facility Technical Standards were developed and approved by the HRSD Commission. These Standards provide detailed requirements for completion of the I/I work and are available in the P3 offices as well as the main webpage, http://www.www.hrsd.com/www.hrsd.com.

3.17.4 Training

Staff training is not applicable in this section.

3.17.5 Information Management

The Enabling Act and other policies are contained within HRSD's intranet site and are posted to the website, www.hrsd.com, if appropriate.

3.17.6 Resource Management

Department directors are responsible for specific programs to provide input and assistance for agreements, ordinances, and policy changes. The time dedicated for specific personnel will depend on the specifics of legal support. HRSD retains outside legal support.

3.17.7 Process for Continuous Improvement

None identified at this time.

3.17.8 Implementation Plan

None identified at this time.

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3.18 Financing and Cost Analysis

3.18.1 Program Definition and Purpose

The purpose of HRSD's Finance Division is to maintain a financially viable organization that can protect and manage its assets. HRSD was among the first utilities to receive the National Association of Clean Water (NACWA) Excellence in Management Award. HRSD is widely recognized as a responsible steward of environmental and financial resources.

3.18.2 Goals and Financial Policies

The goals of the Finance and Cost Analysis Program are to:

- Maintain a financially viable organization that can protect and manage its assets.
- Maintain financial flexibility to continually adapt to regional economic and regulatory changes.
- Preserve and enhance HRSD's sound financial condition.

HRSD's Financial Policy is intended to provide for financial stability and sustainability. The Financial Policy is comprehensive and covers areas such as:

- Budgetary Principles.
- Reserves.
- Debt Management.
- Risk Management.
- Investments Management.

3.18.3 Program Description / Components

3.18.3.1 Operations and Maintenance Cost Analysis Programs

HRSD sets the budgets for the cost of operating and maintaining the interceptor system through its annual operating budget. HRSD's wastewater rates fund all operations as a cost recovery rate. HRSD charges all customers a treatment rate based on residential strength wastewater. Commercial and industrial dischargers that have higher concentration of BOD, TSS, nitrogen and phosphorus are charged a surcharge rate.

3.18.3.2 Budget and Customer Rate Setting Analysis

Annually, HRSD establishes a budget that is approved by the HRSD Commission. As part of the budget development process, rates are analyzed to determine if they require adjustment. A forecast model that factors in operational and capital costs helps guide HRSD in setting and forecasting future rates.

HRSD is funded by user fees paid by households and businesses that are provided wastewater collection and treatment services. HRSD receives no state appropriations for operations. HRSD's Finance Division determines the rates, which are approved by the Commission, by using a forecast model that evaluates the cost of operating the wastewater transport and treatment facilities plus all HRSD overhead cost. The user fees and the rate schedule are evaluated on an annual basis. HRSD contracts with a consultant to review the current rates and ensure that they are accurately allocated based on budgeted costs.

HRSD is required to adopt an operating budget. Revised rates, fees and charges must be advertised for four consecutive weeks in a newspaper of general circulation. The Chief Financial Officer prepares a budget calendar no later than January 31st each year.
Revenue estimates are based on objective and analytical trend data. Rates and fees are established by the Commission and must be set at levels intended to cover related costs. In setting its user rates, HRSD considers the affordability of rates in the context of regional wealth and income indicators.

The operating budget is proposed by each individual division and is set at a level necessary for safe and efficient operation of the wastewater treatment and collection system. Budgetary controls are exercised administratively at the division level. The General Manager is authorized to transfer funds between divisions without further approval by the Commission. Appropriations lapse at the end of the fiscal year. HRSD's operating budget is structurally balanced, whereby one-time revenues are used to pay for one-time expenses or placed into operating reserves. As part of the operating budget, HRSD prepares a 20-year financial forecast detailing projected operating and capital expenses and user rate impacts.

3.18.3.3 Capital Improvement Program Funding

The Capital Improvement Program (CIP) is a long-range planning tool used to summarize needed projects including a description, cost estimate and schedule for each project. The Commission approves the ten-year plan. Projects in the approved CIP are brought before the Commission for specific funding appropriation.

HRSD prepares a CIP on an annual basis. This CIP outlines ten years of anticipated projects and their costs. Funding for HRSD's CIP comes from revenue bonds, grants, clean water revolving loan funds, Water Infrastructure Finance, and Innovation Act (WIFIA) and cash contributions from operations. Improvements in Locality-owned assets in the Regional Wet Weather Management Plan have to be cash-funded.

3.18.3.4 Debt Management Philosophy

Although HRSD is a political subdivision of the Commonwealth of Virginia (the Commonwealth) and a component unit for financial reporting purposes, it is legally and fiscally independent of the Commonwealth and other political subdivisions. HRSD has the authority to issue revenue bonds, notes, or other obligations payable solely from the wastewater revenues it generates. Neither the faith nor the credit of the Commonwealth or any other political subdivision is obligated for HRSD's debt.

HRSD's Commission-approved Financial Policy commits HRSD to, among other things, abide by all its legal covenants contained in its Trust Agreement.

Table 3-2. Debt Management Philosophy

	Senior Debt Service Coverage		Total Debt Service Coverage	
	GAAP	Adjusted	GAAP	Adjusted
Senior Trust Agreement	1.20x (MADS)	None	100x (MADS)	None
Amended Subordinate Trust Agreement	None	None	None	1.20x (Current Year)
Financial Policy	None	1.50x (Current Year)	None	1.40x (Current Year)

HRSD's debt policy requires the CIP to funded by at least 15% cash and senior and subordinate adjusted debt service coverage ratios of 1.5- and 1.4-times annual debt service, respectively. In addition, HRSD has established a policy of maintaining a financial forecast that targets financial metrics, across the twenty-year period, that are consistent with rating agency metrics for a strong, double-A rated credit. The rating agencies regularly review the underlying financial strength of HRSD and other peer utilities.

3.18.4 Training

Staff members are provided on-the-job training as required by their specific job-related duties in the Finance Department. Additional training descriptions related to all HRSD employees are discussed in Section 3.2 of this Program.

3.18.5 Information Management

Financial information is managed in several systems including the Customer Care and Billing System and the

Financial Information System (Oracle ERP).

3.18.6 Resource Management

The Finance Division manages the financial aspects of HRSD's business through four departments: Accounting, Capital Finance, Procurement, and Customer Care Center. The Chief Financial Officer oversees the four departments.

The Accounting Department is responsible for reporting financial results in compliance with accounting principles generally accepted in the United States; performing the treasury function; preparing the operating budget; selling debt; and performing the payroll, accounts payable and risk management functions.
The Capital Finance Department is responsible for maintaining the business side of the enterprise systems and managing the Capital Improvement Program planning and financing.

The Procurement Department manages the purchase of equipment, supplies, and services in compliance with state statutes. The Procurement Department also administers the sale and disposition of surplus property.
The Customer Care Center handles billing, collections, maintenance of customer accounts and liaison with HRSD's customers.
Please refer to Appendix A for identification of staff that is responsible for the execution of this program.

3.18.7 Process for Continuous Improvement

The Asset Management department is working on the development of refurbishment and replacement estimates for all significant assets. It is anticipated that these estimates will be developed over the next three years.

3.18.8 Implementation Plan

None identified at this time.

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3.19 Asset Management

3.19.1 Program Definition and Purpose

The purpose of this section is to describe the Asset Management program for HRSD. Asset Management is a framework for improving decisions about how and when to acquire, operate, maintain, renew, and dispose of assets. Asset Management helps to extend the life of assets, provide manageable replacement schedules, focus resources on critical assets, minimize low-value maintenance activities and enhance data-driven decision making. The Asset Management program provides infrastructure management tools and services through condition assessment, risk-based analysis, and lifecycle monitoring to achieve an optimized balance of performance, cost, and risk.

3.19.2 Goals and Performance Measures

The goals of HRSD's Asset Management program are to:

- Maintain and improve organizational and asset specific risk management procedures that define HRSD's risk policy, governance (roles and responsibilities), criteria for assessing risk, and the process and methodologies to be used for risk management.
- Identify the levels of service that describe the outputs HRSD intends to deliver to customers and stakeholders.
- Maintain and improve Asset Management Plans (AMP) for specific systems that specify the levels of service required, report the condition and performance of the assets within that system, report the results of asset risk assessments and recommended mitigating actions, and provide a financial forecast of capital and operating expenditures.
- Maintain and improve a consistent and comprehensive life-cycle management approach that assesses the impacts to assets throughout the entire life cycle in order to invest in the right infrastructure at the right time.
- Enhance existing tools and processes and develop new tools and processes that improve asset data collection and management, which will allow HRSD to have easier access to the information needed to make confident decisions on the need and timing of asset repair and replacement.
- Perform risk analyses and consider the risk determinations on all decisions regarding assets, particularly how and when to repair/replace assets.
- Enhance asset maintenance data collection to provide a better understanding of asset performance that will allow HRSD to make smarter decisions regarding how and when to replace assets.
- Maintain and improve tools and processes to move maintenance activities from being schedule-based to need-based or risk-based.

3.19.3 Program Description / Components

HRSD has been performing Asset Management to some degree from the beginning of HRSD's existence. This includes performing routine maintenance and inspections on HRSD's assets and utilizing a CMMS to dispatch asset work and collect asset information. The framework for the AMPs has been established and data is currently being collected to finalize the AMPs.

3.19.4 Training

HRSD personnel responsible for maintaining assets and collecting data on assets are trained on how to use the CMMS software and additional training sessions are made available when changes are made to the software. As new Asset Management components are developed, specific training needs will be determined and provided.

3.19.5 Information Management

HRSD performed a data needs assessment to identify existing data sources, assess future needs for data in

support of asset management activities and decision-making, and to determine the suitability of that data to support those needs. This includes the existence of data sets determined to be necessary for asset management, what systems are used to manage and store data, responsibilities for data maintenance, how data is being used (analysis, evaluation, and reporting), and opportunities for data management improvement.
See Section 3.14.3.1 for the list of Asset Management Databases and their uses.

3.19.6 Resource Management

The Asset Management Department is responsible for developing the tools and processes necessary to meet the goals of this Asset Management program. The Asset Management Department is led by the Director of Asset Management that reports to the Chief Engineer. The Asset Management Department includes three sections. The Interceptor Condition Assessment Section, the Treatment Condition Assessment Section and the CMMS Section. Both Condition assessment sections include Condition Assessment Manager, CA Analyst, and CA Superintendent and several CA inspectors that are responsible for assessing HRSD's infrastructure. The CMMS Section includes two CMMS Analysts that administer the CMMS and assist work centers with developing custom reports and monitor the integration with other enterprise systems. Maintenance Planners are assigned to each treatment plant and interceptor operations work center. They are responsible for developing preventive maintenance schedules and performing quality assurance of work orders to ensure data consistency and accuracy.

All HRSD staff are responsible for implementing/utilizing Asset Management tools and processes to meet the goals of our program. HRSD is performing a comprehensive resource and competency assessment that evaluates the resource needs to implement and sustain the Asset Management program, planning and scheduling staff to manage the various asset management systems and databases, and the competencies required for the additional roles and responsibilities identified. Based on the assessment finding, a resource plan and recommendations for new or modifications to job descriptions will be developed.

3.19.7 Process for Continuous Improvement

The Asset Management program, plans, processes, procedures, and standards will be regularly reviewed and updated through monitoring outcomes and key performance indicators, lessons learned, and knowledge gained on new asset management approaches.
The following elements have been identified for continuous improvement: HRSD will continue to enhance asset data collection and management.

- HRSD will develop tools and processes to evaluate the risks associated with asset management decisions.
- HRSD will perform risk analyses and consider the risk determinations on all decisions regarding assets, particularly how and when to repair/replace assets.
- HRSD will develop tools and processes to move maintenance activities from being schedule-based to need-based or risk-based. HRSD will develop tools and processes to provide data and recommendations for long-term financial planning.

3.19.8 Implementation Plan

Process for Continuous Improvement	Implementation Plan
Continue to implement the asset management program	Ongoing

3.20 Microbial Source Tracking Program

3.20.1 Program Definition and Purpose

Restoring waterways impacted by bacteriological impairments requires a thorough understanding of the sources of bacteria contributing to the impairment. Several water bodies in the Hampton Roads region remain impaired by bacteria with elevated levels found in dry weather in areas that have no record of sewer overflow and in some cases, in areas without any public sewer infrastructure. Dry weather, ongoing, sources almost always present a greater impact to water quality than isolated wet weather-related sewer overflows. Surface water monitoring data following SSOs has indicated that the impacts of a transient SSO on the long- term impairment of a waterway are minimal, supporting the conclusion that waterway impairments in the Hampton Roads area are driven by chronic and persistent sources. Given that the regional sanitary sewer system has no chronic capacity-related overflow locations, the most effective approach toward achieving a higher degree of public health protection is to identify and eliminate the sources of bacterial contamination, specifically those that are known to represent the greatest risk to public health – human sources. To this end, HRSD has implemented its Microbial Source Tracking Program (referred to as the Pathogen Source Tracking Program in the RWWMP). This focused water quality monitoring effort, in partnership with local governments and the Virginia Department of Health, has been successfully used to identify, locate, and eliminate chronic and persistent non-SSO-related sources of human-sourced bacteria.

3.20.2 Goals and Performance Measures

The goal of this program is to identify, locate, and eliminate chronic and persistent non-SSO-related sources of human-sourced bacteria. HRSD plans to invest ten million dollars through 2030 within the Regional Sewer System through infrastructure repairs, field work, and analyses.

Goals		Performance Measures	Target Value
Microbial source tracking	Invest ten million dollars through 2030 within the Regional Sewer System through infrastructure repairs, field work, and analyses.	Monetary dollars spent per fiscal year	Trend

3.20.3 Program Description/Components

HRSD's Microbial Source Tracking Program represents a significant investment in the development of novel molecular technologies for microbial source tracking. The human-specific molecular analyses conducted within HRSD's laboratory have a high degree of sensitivity and specificity allowing for the detection of human sources of bacteria in stormwater, surface water and sewer infrastructure samples. These molecular tools, when coupled with a thorough understanding of the wastewater and stormwater infrastructure, have successfully aided in identifying compromised infrastructure or in narrowing the human fecal contamination signal to a smaller, well-defined area. Informed, adaptive results-based decisions used in tandem with local knowledge of sanitary sewer and stormwater maps allow HRSD to back trace a human fecal signal to a point of origin.

Once the point of origin for the fecal signal is identified, corrective action measures are implemented, and subsequent monitoring is used to confirm successful elimination of the source. A tailored, adaptive program such as this represents a more cost-effective means of improving water quality and reducing risk to public health as opposed to broad brush approaches that fail to consider the unique characteristics of each waterway. For example, identifying and resolving a (1) residential connection to a storm sewer (instead of the sanitary sewer), (2) broken sewer line (public or private) near a stream, (3) failing septic facility, or (4) other continuous sources (straight pipe connection from private property to local waterway) will yield far greater water quality and public health benefits than reducing large sewer overflows from major storms.

3.20.4 Training

The Technical Services Department staff in-house with on-the-job training of Microbial source tracking protocols. Laboratory analysts are trained in-house and maintain demonstration of Microbial source tracking protocols.

3.20.5 Information Management

Information and analyses for the Microbial source tracking Program is stored electronically on HRSD's network.

3.20.6 Resource Management

The employees in the Water Quality Division work under the direction of the Chief of Water Quality. Please refer to Appendix A for identification of staff that is responsible for the execution of this program.
Contract laboratories are utilized if needed to meet demand.

The TSD Molecular Laboratory and the Central Environmental Laboratory utilize state-of-the-art analytical equipment and methods.

Research vessels are used for ambient waters and various other vessels are used for other Water Quality purposes.

3.20.7 Process for Continuous Improvement

The TSD Molecular Laboratory develops new analytical methods as necessary.

3.20.8 Implementation Plan

Program Milestone	Description	Time frame
Round 1 Microbial source tracking Program	Invest ten million dollars through 2030 within the Regional Sewer System through infrastructure repairs, field work, and analyses.	2020 - 2030
Round 2 Microbial source tracking Program	Invest ten million dollars through 2040 within the Regional Sewer System through infrastructure repairs, field work, and analyses.	2030 - 2040

4. IMPROVEMENT PROGRAM AREAS

4.1 Regional Wet Weather Management Plan (RWWMP)

EPA has encouraged the use of adaptive management approaches in a wide variety of settings. Adaptive management features iterative decision-making to manage uncertainty in addressing municipal environmental challenges. This approach has been particularly necessary with long-term community sewer rehabilitation and related programs. Almost every such program has needed multiple major modifications. In addition to responding to changing community circumstances, adaptive management also allows communities to continually prioritize the greatest public health and community benefits for the next public dollar invested.

Given the scope, cost, complexity, and evolving nature of the challenges that HRSD and the Hampton Roads region face, the RWWMP necessarily features an adaptive management approach. HRSD investments will include improvements to HRSD and Locality infrastructure and could include improvements to Private Property infrastructure.

There are other adaptive management factors that create significant uncertainties (and opportunities) about any infrastructure investment plan that spans more than a decade. These uncertainties/opportunities include:

- The impact of sea level rise and recurrent flooding on the region's infrastructure and the regional response.
- Understanding the system response to wet weather capacity-related (Interim System Improvements, Condition Assessment and Repairs, Rehab Action Plan, High Priority Projects) investments and evaluations.
- Magnitude and spatial patterns of community growth and redevelopment.
- Future of the Department of Defense (DoD) facilities in the Hampton Roads Region.

4.2 Saltwater Inflow and Infiltration (I/I) Detection and Reduction

The geography of the HRSD area is dominated by water in the form of coastlines, bays, inlets, and countless tidal tributaries. The already low-lying land is suffering from subsidence and is considered second only to New Orleans as the most vulnerable area in the country to sea level rise. HRSD is currently under a Federal Consent Order to reduce saltwater entering the sanitary sewer system. In addition, HRSD is investigating industrial processes as a source of saltwater into the regional sewer system.

Saltwater from I/I not only reduces the capacity of the collection system, but it also leads to nitrification and settling issues at downstream treatment facilities from the introduction of salt into the system. Using conductivity as an indicator of saltwater, HRSD has installed permanent conductivity sensors at multiple sites throughout the collection system and data has shown that saltwater is present during non-tidal and tidal events. Saltwater is also known to be a significant source of bromide. For future SWIFT facilities, controlling influent bromide is critical in reducing the bromate formation potential in the SWIFT advanced water treatment systems. HRSD has formed a cross- departmental team to better understand and quantify sources of saltwater and is continuing to refine the investigation methods by deploying additional permanent and temporary conductivity sensors into upstream basins and using tidal information with pump run times to isolate areas for physical inspection and rehabilitation.

- How effectively Locality and HRSD Management, Operations, and Maintenance (MOM) programs will address sewer system degradation and inflow/infiltration (I/I) levels.
- Regional economic vitality, household income and employment levels.

- Changing regional, environmental, and public health priorities, specifically post-implementation evaluation of the Chesapeake Bay TMDL (Total Maximum Daily Load) required reductions.
- Changing technologies and opportunities to achieve multiple benefits for public sewer-related investments; and,
- Levels of federal and state financial support for unfunded environmental mandates.
- Service area system flexibility to better utilize available capacity.

These uncertainties will have a profound effect on the location, volume, significance, and priority of future wet weather capacity-related overflows. This will particularly be the case for the capacity-related investment for the period beyond 2030.

As part of HRSD's RWWMP, High-Priority Projects will be constructed through 2040. This investment will reduce modeled SSO volume during the 5-year peak flow event by 69% - a significant reduction. Figure 4-1 depicts this reduction in modeled SSO volume during the 5-year peak flow event. Efforts to address the minimal SSO volume remaining upon completion of the High-Priority Projects would be cost-prohibitive and return marginal benefits for each dollar invested.

4.3 Smart Sewers (Strategic Automation)

HRSD is piloting a "Smart Sewers" program that could potentially optimize sewer system performance to further reduce overflows and to best handle sewer system flows in the areas of the collection system that are best suited at any given time to handle these flows. This initiative is contingent on completion of the SCADA System Upgrades project which is currently underway.

A smart sewer system relies on real-time monitoring data to inform operators of the flow characteristics of the collection system during a variety of flow conditions. Monitoring data is collected from a number of points in the collection system, providing the operations staff with a current picture of system operations. This information is fed into analysis software that operations staff can use to make decisions regarding efficient operation of the system – including options to prevent surcharge or the release of wet weather flows during rain events.

Advanced smart sewer system design incorporates automated system control algorithms into analysis software which enables automatic operation of the collection system in response to a wet weather event. This can include automatic operation of gates and valves to maximize storage and conveyance of the collection system. In addition to maintaining the smart system software, an automated system requires the installation of control structures that can be operated remotely.

Part of HRSD's program includes planning and implementing a systematic and strategic smart sewers program beginning in areas of the expansive collection system that would derive greatest benefit first, and as budget allocations allow.

4.4 Consolidation/Efficiency

HRSD is constantly looking for ways to gain efficiencies to manage long-term costs and improve the quality of their operations. In this spirit of continuous improvement, numerous initiatives are listed below.

4.4.1 Boat Harbor Closure Plan

The Boat Harbor Treatment Plant is located at the end of the peninsula in Newport News on a highly constrained site that's susceptible to coastal flooding. This facility was constructed using stacked facilities and the opportunity for expansion and/or improvement of the treatment process is extremely limited. HRSD is closing Boat Harbor Treatment Plant and routing the flows to the Nansemond Treatment Plant in Suffolk via a new pump station and transmission force main no later than the end of 2026. This strategy reduces nutrients discharged to the James River, avoids the cost of future upgrades at Boat Harbor, reduces HRSD staffing requirements and mitigates flooding risks.

4.5 Sustainable Water Initiative For Tomorrow (SWIFT)

HRSD's Sustainable Water Initiative for Tomorrow (SWIFT) is an innovative water treatment project in eastern Virginia that will further protect the region's environment, enhance the sustainability of the region's long-term groundwater supply, and help mitigate environmental pressures such as sea level rise and saltwater intrusion. The project will take HRSD's already highly treated water that would otherwise be discharged into the James River and put it through additional rounds of advanced water treatment to produce drinking-quality water, SWIFT Water™, which will then be added to the Potomac aquifer, the primary source of groundwater throughout eastern Virginia. This can help improve water quality in local rivers and the Chesapeake Bay, while ensuring a sustainable source of groundwater for generations to come.

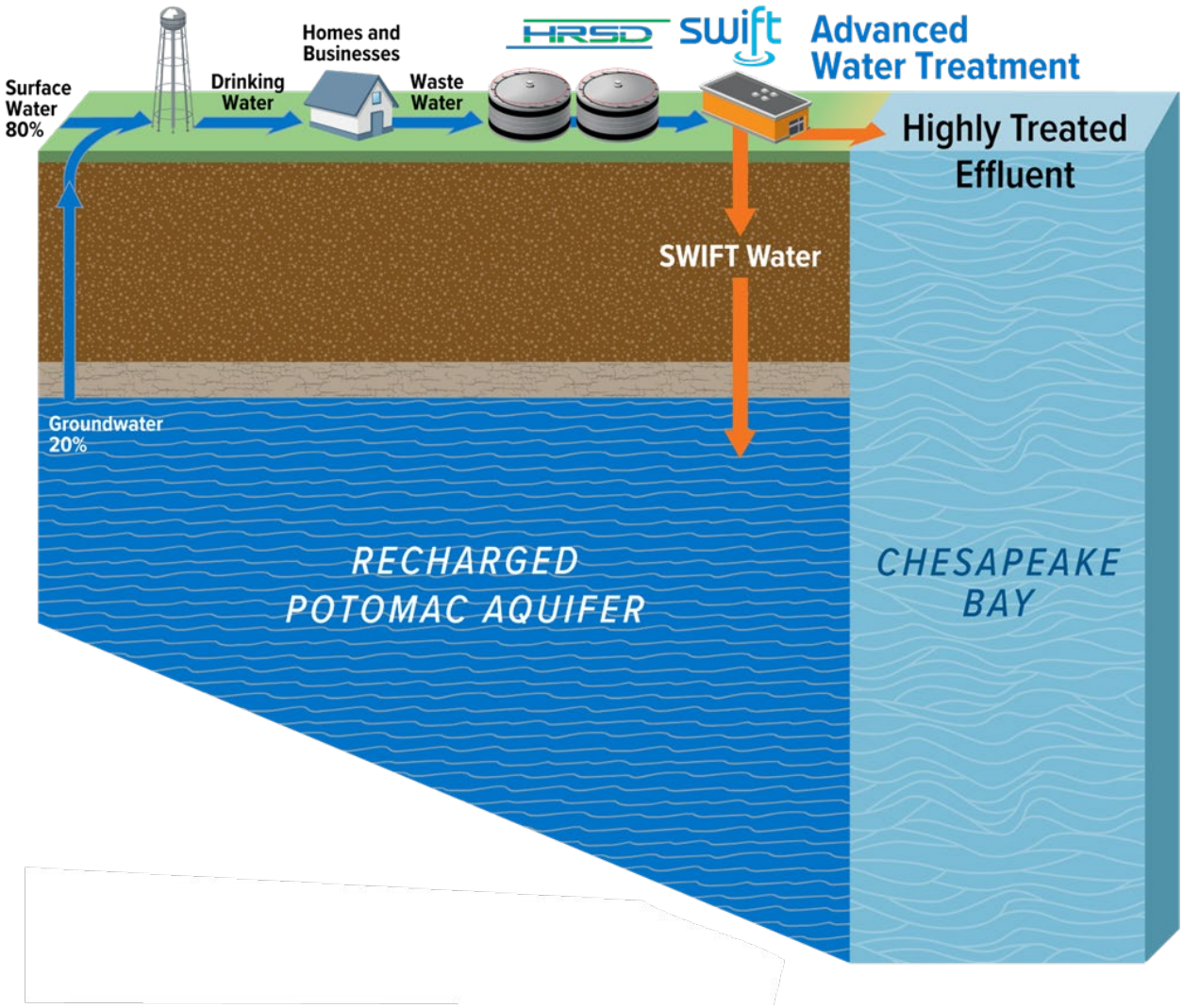

Figure 4-1. SWIFT

4.5.1 Planned Facilities

Implementation of full-scale SWIFT will require the design and construction of facilities including Advance Nutrient Reduction Improvements (ANRI), Advanced Water Treatment (AWT) facilities, pumping and piping for distribution of SWIFT Water™ and recharge and monitoring wells for replenishment of the aquifer. Based on capital and operating costs, treatment objectives, and SWIFT Water™ quality, HRSD has selected an ozone-biofiltration based advanced water treatment process. Figure 4-2 shows the process flow diagram for advanced water treatment at the SWIFT Research Center.

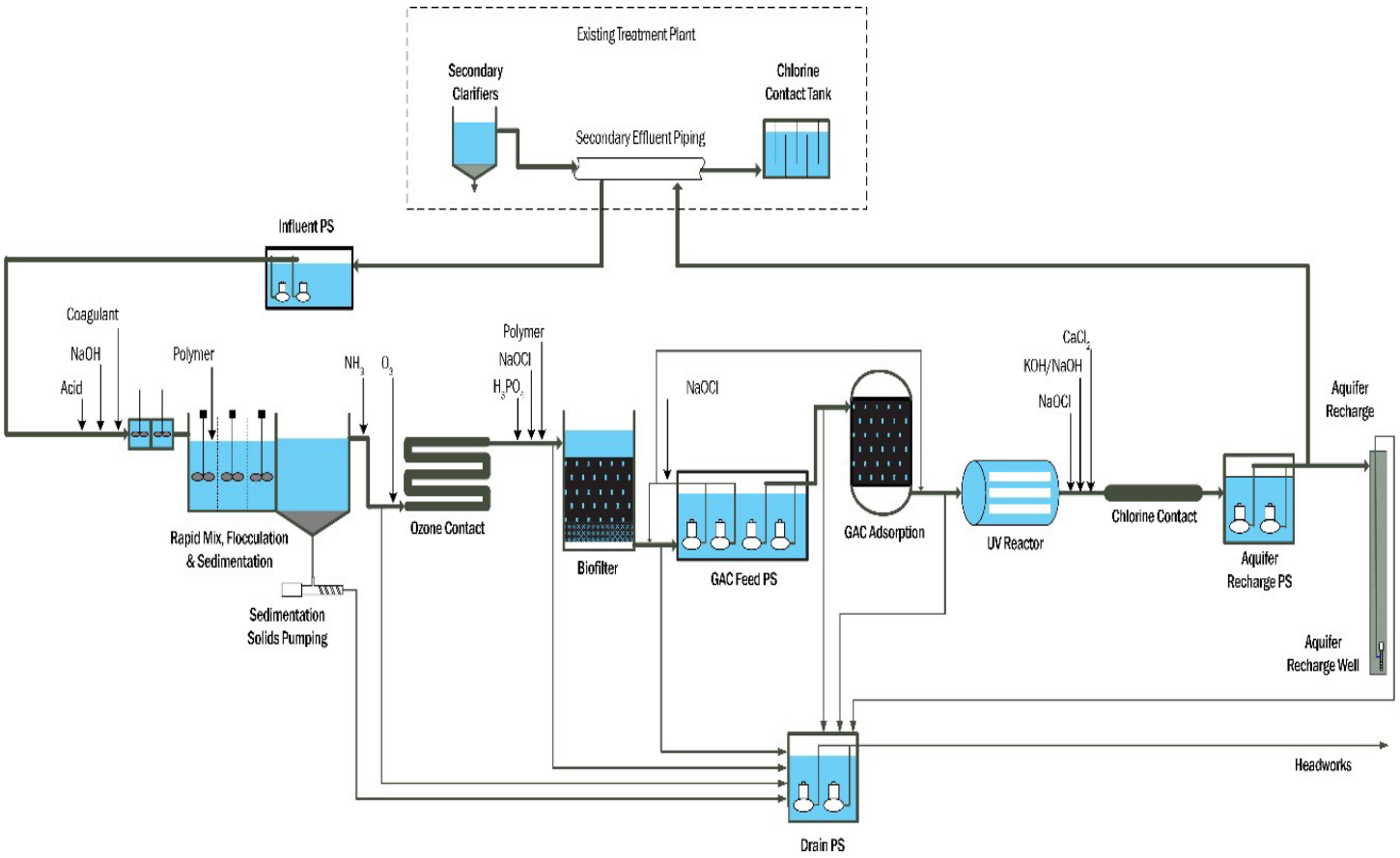

Figure 4-2. SWIFT Research Center Process Flow Diagram

HRSD constructed the SWIFT Research Center (SRC) with 1 MGD advanced water treatment capacity at the Nansemond Treatment Plant, which commenced operation in May 2018. HRSD is planning to build AWT facilities for the full-scale SWIFT Program to treat average daily flow from James River and Nansemond treatment plants. SWIFT is being implemented through a collaborative, integrated planning approach that highlights the philosophy of "One Water". The first phase of full-scale SWIFT will comply with two key regulatory programs, Clean Water Act and Chesapeake Bay Watershed Implementation Plan, while saving the region billions of dollars. Future phases of SWIFT implementation will be initiated as environmental and regulatory needs arise.

4.5.2 Source Control

HRSD relies on a rigorous Pretreatment Program to safeguard the treatment processes and

maintain its ability to produce the highest quality of water possible. HRSD's Pretreatment Program reduces the amount of harmful pollutants entering its facilities by managing hundreds of sources of industrial waste throughout Hampton Roads. Industrial waste includes but is not limited to all wastewater from any producing, manufacturing, processing, institutional, commercial, agricultural or other operations from which the wastewater discharged includes wastes of non-human origin.

This water is more likely to contain higher amounts and more types of harmful chemicals than the wastewater that comes from homes and is therefore extensively regulated by HRSD's Pretreatment and Pollution Prevention (P3) Department. P3 staff routinely inspects hundreds of industries and commercial and service facilities throughout Hampton Roads to ensure they are complying with HRSD's rigorous Industrial Wastewater Discharge Regulations. These include hospitals, manufacturing and chemical production facilities, food processing plants, municipal solid waste landfills, waste haulers, and many other types of businesses and industries. Of these, approximately 160 have been issued permits and others are regularly monitored to ensure they are not discharging harmful chemicals or heavy metals to HRSD's wastewater treatment plants. HRSD's most effective step in maintaining its record of high-level treatment is to control these pollutants at their sources.

This involves prohibiting industries from adding more incompatible pollutants to the HRSD collection system than the treatment process can remove, or even prohibiting discharge of them entirely. Some pollutants are known or suspected to build up in the environment over time and cause significant harm. Because of this, industries are strictly prohibited from sending these types of pollutants to HRSD's wastewater treatment plants. These Zero Discharge Pollutants include many chemicals that were once widely used in commercial industries but have since been outlawed, such as PCBs (polychlorinated biphenyls) and TBT (tributyltin).

In addition to monitoring and regulating constituents that are associated with NPDES discharge regulations, HRSD implements source control by monitoring the permitted industries and the service area conveyance systems to identify wastewaters that may have an impact on the SWIFT Advanced Water Treatment processes. These constituents include but are not limited to bromide and 1,4-dioxane. Sources found to have a detrimental impact on the SWIFT processes will be assessed on a case-by-case basis to determine the best course of action to limit any further impact, which may include site specific limits.

4.6 Federal Facilities

HRSD has identified through modeling and field investigative work that Federal Facility sewer systems tributary to the HRSD regional system contribute high levels of I/I during wet weather. The degree to which the individual facilities contribute excessive wet weather flow varies.

HRSD, through their enabling legislation, has broad authority to pursue the remediation of these contributory sources of wet weather flow. HRSD can and does place Federal Facilities under Consent Order to achieve peak flow reductions.

At present, HRSD is systematically working with the Federal Facilities using I/I Orders to first complete sewer system investigative, to include flow monitoring, and SSES work and then to improve and/or rehabilitate the Federal Facility systems. Federal Facility Technical Standards (FFTS) have been developed and approved by the HRSD Commission. The Standards provide detailed requirements for measuring and quantifying improvements. HRSD has prioritized the Federal Facilities systems and is working with each in the order of priority to reduce wet weather flows from these sources. In certain circumstances, the order of priority was adjusted to better comply with funding and resources for the Federal Facility. The FFTS were updated in 2019 to clarify inconsistencies in the original doc and posted to www.hrsd.com.

The first Order was issued in July 2015 and the last Order was issued in October 2019. There are currently 18 federal facilities total under an HRSD I/I Order; however, there are only 14 active Orders. The Order for Camp Peary was closed out in September 2019 and the Order for Naval Support Activity (NSA) Hampton Roads, Norfolk was closed out in July 2022 after flow monitoring and modeling showed they met all requirements. The Order for NSA Hampton Roads, Portsmouth Annex (Naval Hospital) is currently suspended until July 2024 due to funding and issues with the City of Portsmouth sewerage system backing up into their sewerage system. Naval Station Norfolk's Order was suspended in February 2023 due to issues associated with flow monitoring and operations at the HRSD Taussig Boulevard Pump Station. In addition to HRSD replacing the effluent meters at the pump station, data analysis was performed to provide the Navy validated flow data. The Order for Naval Station Norfolk is on schedule to be reactivated during the first quarter of 2024.

4.7 Carbon Footprint (Power Consumption Focus)

HRSD is committed to reducing its greenhouse gas emissions and its carbon footprint. HRSD's greatest measurable contribution to greenhouse gas emissions is its energy consumption. Despite additional electrical loads associated with recent construction at our treatment plants and the addition of pump stations, HRSD has been making progress at becoming more energy efficient. As evidence of those efforts, HRSD has maintained a relatively consistent level of consumption (kWh) from 2005 to the present. HRSD will continue to do the following:

- Look for opportunities to use more energy efficient equipment in our plants and pump stations.
- Look for opportunities to use automated systems and processes to save power in our plants and pump stations.
- Look for opportunities to change operational behaviors that translate into power savings.
- Offset a portion of our carbon footprint through the installation and use of LED lighting.
- Offset a portion of our carbon footprint through the installation and use of photovoltaic systems.
- Offset a portion of our carbon footprint through procurement of green power and other green initiatives.

4.8 Hydraulic Model

The Hydraulic Model is a necessary planning and operations tool used to determine how changes in flow and infrastructure impact the performance of the Interceptor System. The Hydraulic Model is a critical asset. In May 2018, HRSD brought management of the Regional Hydraulic Model (RHM) in house; model maintenance and calibration will be managed by Planning and Analysis staff.

Maintenance of the RHM will include data updates from the Localities in order to add new service areas as well as reflect changes to the existing system. These updates will include any new or updated facility information such as piping, pump stations, and manholes. Updates to flow information will be supported by flow monitoring to justify a change in the calibrated model. This update process will also include continued validation and calibration of the model to keep it as accurate as possible.

The RHM is also updated with regional population projections as developed by the Localities and coordinated through the Hampton Roads Planning District Committee (HRPDC). The population projections are added into the RHM and are used to evaluate and to plan for long term capacity of the system.

4.9 Building Information Modeling (BIM)

HRSD has developed BIM standards and specifications for newly constructed vertical facilities (treatment plants, pump stations, administrative facilities, etc.). The overall objective of BIM implementation is to use BIM technology for effective design, construction, and data management of major equipment to enhance the lifecycle management of assets. BIM technology will provide HRSD with a 3-dimensional visualization of vertical facilities along with associated equipment data that will enable staff to locate and track information on

facilities similar to the GIS process for linear assets.

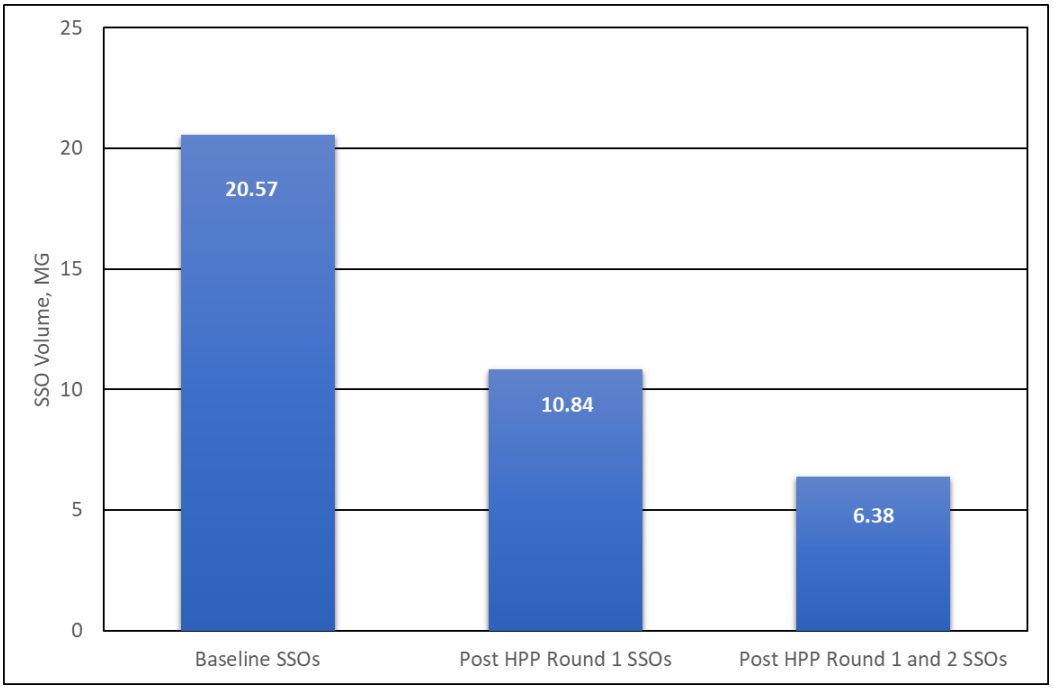

Figure 4-3. High-Priority Project Modeled SSO Reduction

The economic stress on the residents of the region, coupled with ever-changing environmental priorities, necessitates an adaptive management approach to allow the region to make wise future investments through understanding and responding to the conditions as they exist in that future timeframe.

Accordingly, HRSD's RWWMP features an Adaptive Regional Plan comprising four phases as follows:

Table 4-1. Four Phases of the Adaptive Regional Plan

Phase	Description	Timeframe	Cost
1	Planning, Interim System Improvements, Condition Assessment and Repairs, Rehabilitation Action Plan	2008 – 2027	$700,000,000
2	Round 1 High-Priority Projects and Microbial Source Tracking Program	2020 - 2030	$218,000,000
3	Round 2 High-Priority Projects and Microbial Source Tracking Program	2030 - 2040	$212,000,000
4	Post-RWWMP Plan Performance Assessment	2040 – 2043	$2,000,000
	TOTAL		**$1,132,000,000**

This Regional Wet Weather Management Plan is an environmental and economic necessity and is consistent with EPA policy and guidance on adaptive management and integrated planning. In this plan, HRSD will have spent at least $1.132 billion by 2040 addressing the most pressing collection system and interceptor system challenges, which is in addition to the money spent for the Aquifer Replenishment Program addressing the most pressing and important environmental challenges that the region faces. This spending will place a heavy burden on regional ratepayers. It is necessary to re-evaluate the needs and circumstances in 2030 to better identify the highest regional environmental and public health priorities at that time as well as an expeditious implementation schedule for additional sewer system investments.

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5. Audits and Performance Evaluation of MOM Program

5.1 MOM Program Audits

Audits and performance evaluations of HRSD's MOM Program will occur at intervals of approximately three years, to evaluate changes and/or deficiencies in the MOM program and steps to respond to them. Revisions, as appropriate, will be made as results of the audit and evaluation and other circumstances indicate. An audit and evaluation of the MOM after approval of the RWWMP was performed in 2023. In addition, the MOM Performance Metrics are reviewed quarterly.

Audits will include evaluation of each MOM program element for consistency with current program elements. Changes in processes or procedures shall be updated during these audits. Previous versions of the MOM document are available upon request.

5.2 Performance Evaluations

The system performance data will be reviewed in conjunction with the program element performance measures identified in Sections 2 and 3 of this document. When analyzed together, this relevant information will allow diagnosis of any areas that need adjustment, additional resources, or increased emphasis.

Although the MOM document will be reviewed and updated on a three-year basis, the overall system performance will be evaluated on an annual basis.

Tables 5-1 through 5-4 are tools for identification and review of trend information over a three-year period. Table 5-1 is a collection of system characteristics such as length of pipe and number of pump stations. Table 5-2 is production data such as millions of gallons of wastewater treated and number of point repairs. This information helps evaluate the overall effort being put forth in the system. Table 5-3 presents data on the number and cause of overflows and STP releases. Table 5-4 presents data on the volume of overflows and STP releases by cause. Particular attention will be paid to wet weather related SSOs and STP releases. Monitoring overflow volumes at HRSD's STPs can be used to identify whether overflow volumes or excess flows are being shifted from the collection system to the STPs (or vice versa) with no actual reduction in the overall volume. System performance only measured by overflow volumes in the collections system may show decreasing volumes, however, these volumes may simply have been pushed downstream to the STPs where new overflows could occur. Table 5-5 presents metrics that have been either completed or removed from the MOM program since the last update and the reasoning behind it.

The annual assessment complements ongoing internal audit of system data and provides an opportunity to reflect on the current year's performance data and compare results with recent year's performance data to determine if there are any trends which identify the need for program adjustments. Two important trends to monitor that are indicative of overall net performance are SSOs and STP releases. In addition to monitoring trends over time for each of these outcome-based measures, a review of the relationship, if any, between these measures will be conducted. For instance, if wet weather related SSOs are increasing in a particular STP service area, are wet weather related STP releases also trending up? This effort helps to focus improvement initiatives in areas that have a direct impact on system performance. Results and trends noted from the internal audit and performance assessment will be communicated to appropriate parties. The results and trend could provide necessary data to revise practices and procedures.

Table 5-1. MOM Program Performance Assessment Report, Part I			
Part I. Sewer System Characteristics:	**FY2021**	**FY2022**	**FY2023**
Total length of gravity sewer (ft.)	251,391	251,391	251,391
Total length of force main (ft.)	2,572,717	2,559,784	2,689,756
Total number of manholes	1,236	1,236	1,236
Total number of pump stations	69	68	69
Total number of pressure reducing stations	19	21	21

Table 5-2. MOM Program Performance Assessment Report, Part II			
Part II. Production Data:	**FY2021**	**FY2022**	**FY2023**
Total billion gallons of wastewater treated	56.27	48.45	49.24
Total LF Gravity sewer main CCTV inspected	40,148	42,187	42,308
Total number of Gravity Main Point Repairs	3	2	0
Total number of manholes inspected	202	311	261
Total LF Gravity sewer mains replaced	0	0	75
Total LF Gravity sewer mains rehabilitated	23,188	477	480
Total number of manholes rehabilitated	165	0	27
Total Miss Utility Tickets	45,279	50,111	50,684
Total LF Force Main Inspected	93,236	249,615	190,232
Total Number of FM Point Repairs	12	5	4
Total LF FM Replaced	0	4,530	8,602
Total LF FM Rehabilitated	0	0	0

Table 5-3. MOM Program Performance Assessment Report, Part III-A			
Part III. -Performance Data, number:	**FY2021**	**FY2022**	**FY2023**
Total Number of SSOs:	45	10	8
SSOs (#/%): caused by:			
Maintenance, Roots	0	0	0
Maintenance, Debris	0	0	0
Maintenance, Grease	0	0	0
Power Loss	1	0	0
Damage by Others	2	0	2
Capacity, Wet Weather Related	30	0	3
Infrastructure	9	8	2
Other	1	1	0
Third Party Actions	1	1	1
Total:	45	10	8
Total Number of STP Releases*	37	23	31
STP Releases Wet Weather Related	8	0	2
STP Releases, Maintenance	9	0	3
STP Releases, Infrastructure	15	15	14
STP Releases, Third Party	4	5	8
STP Releases, Other	1	1	4

**STP releases tracked in this program will be wastewater receiving less than secondary treatment.*

Table 5-4. MOM Program Performance Assessment Report, Part III-B			
Part III. -Performance, Data, volume:	**FY2021**	**FY2022**	**FY2023**
Total Overflow Volume, gallons	37,936,165	1,095,532	2,713,510
Overflow volumes (gallons) caused by:			
Maintenance, Roots	0	0	0
Maintenance, Debris	0	0	0
Maintenance, Grease	0	0	0
Power Loss	250	0	0
Damage by Others	154,000	0	2,500,450
Capacity, wet weather related	279,059	0	18,510
Infrastructure	3,244,626	1,083,732	97,025

Table 5-4. MOM Program Performance Assessment Report, Part III-B			
Part III. -Performance, Data, volume:	**FY2021**	**FY2022**	**FY2023**
Other	15,000	1000	0
Third Party Actions	39,500	10,800	500
Total overflow volume (gallons):	37,936,165	1,095,532	2,713,510
Total Volume of STP Releases (gallons)*	7,353,408	138,217	806,981
STP Releases Wet Weather Related	8	0	2
STP Releases, Maintenance	9	0	3
STP Releases, Infrastructure	15	15	14
STP Releases, Third Party	4	5	8
STP Releases, Other	1	1	4

**STP releases tracked in this program will be wastewater receiving less than secondary treatment.*

Table 5-5. MOM Program Completed/Removed Metrics		
Goal	**Performance Measure**	**Reason for Change**
Customer Information - Communications	Provide information to the public using the most appropriate outreach strategy, which may include posting announcements on the HRSD website and/or social media channels, issuing a news release, holding communications briefings, or placing advertisements.	Does not provide value to the MOM program. HRSD is currently tracking these measures as part of their Strategic Plan.
Customer Information – Environmental Education	Sponsor, promote or participate in events that promote and encourage environmental awareness.	Does not provide value to the MOM program. HRSD is currently tracking these measures as part of their Strategic Plan.
Customer Information - Billing	(No. of adjustments per year made to customer bills due to errors / No. of customer bills per year) X 100 %	Does not provide value to the MOM program.
Customer Information – Response	(No. of responses to customer calls or emails completed within five business days / No. of customer call or email responses per year) X 100%	Does not provide value to the MOM program.
Engineering – CIP Planning	(Actual # of CIP projects completed in FY / Proposed # of CIP projects planned for completion in FY) x 100%	Replaced with more relevant MOM Metrics.

APPENDIX A – HRSD ORGANIZATIONAL CHARTS

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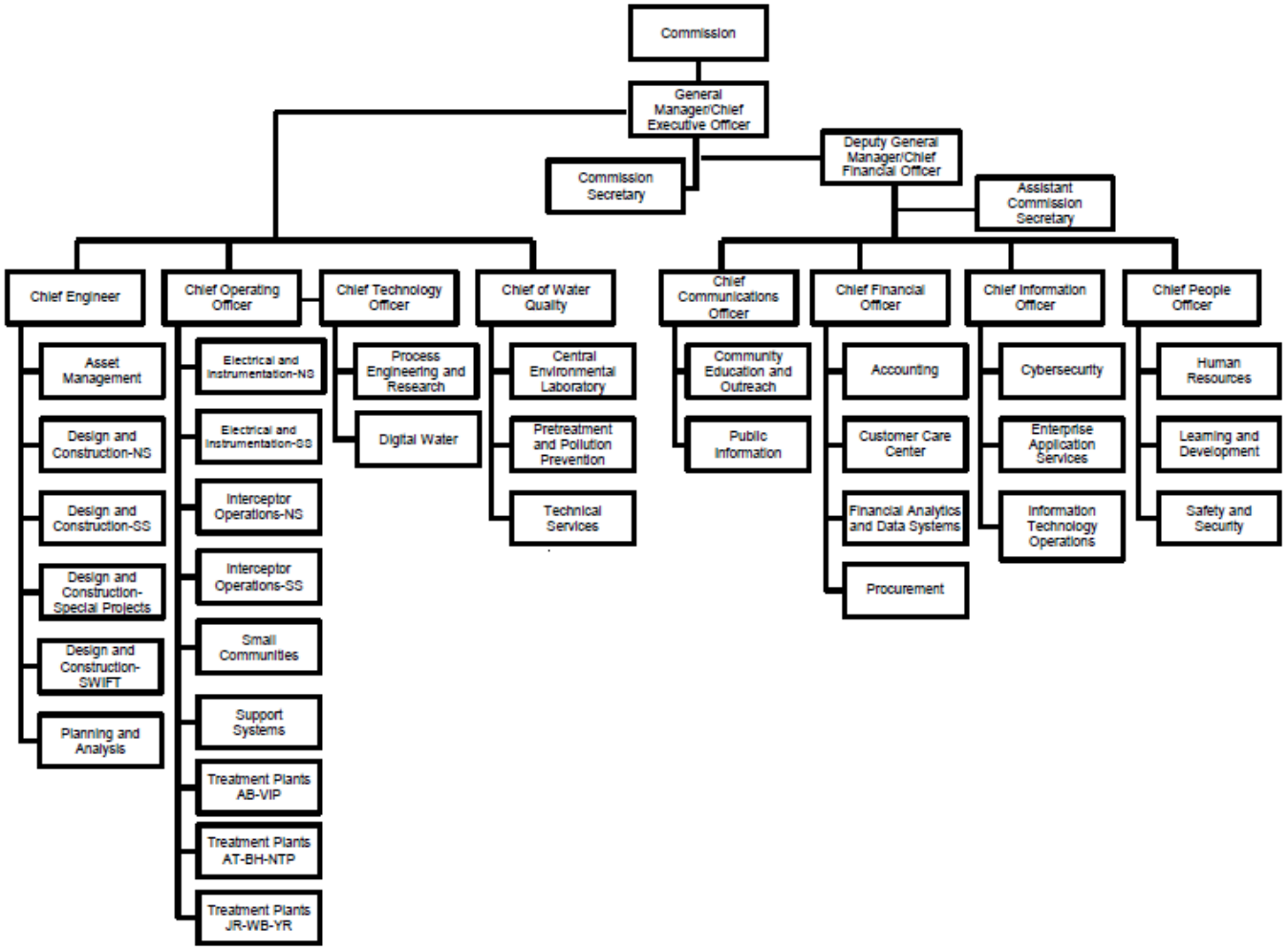
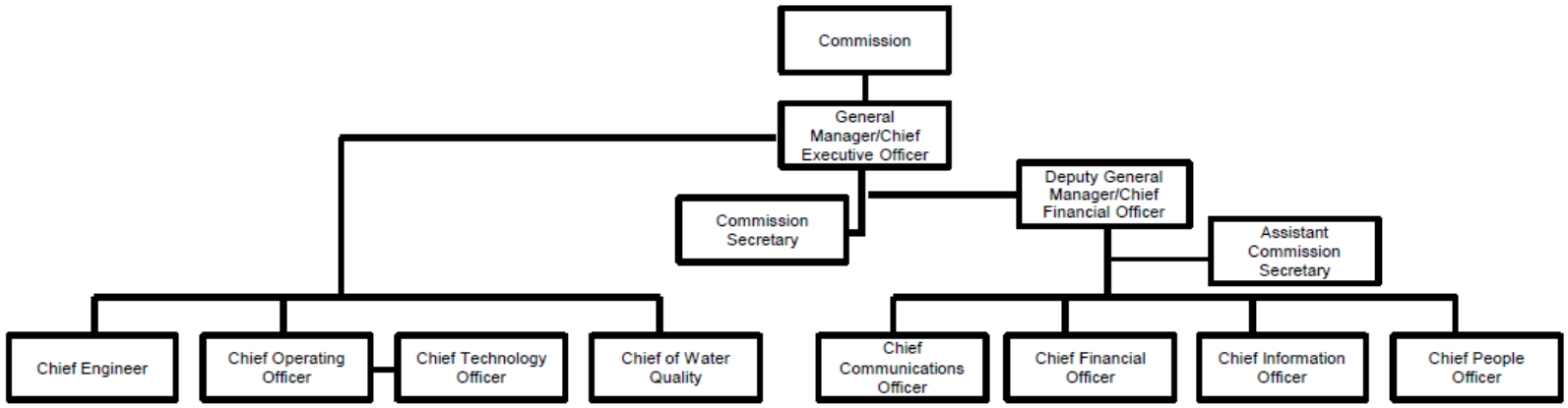
HRSD Organization Chart

July 1, 2024

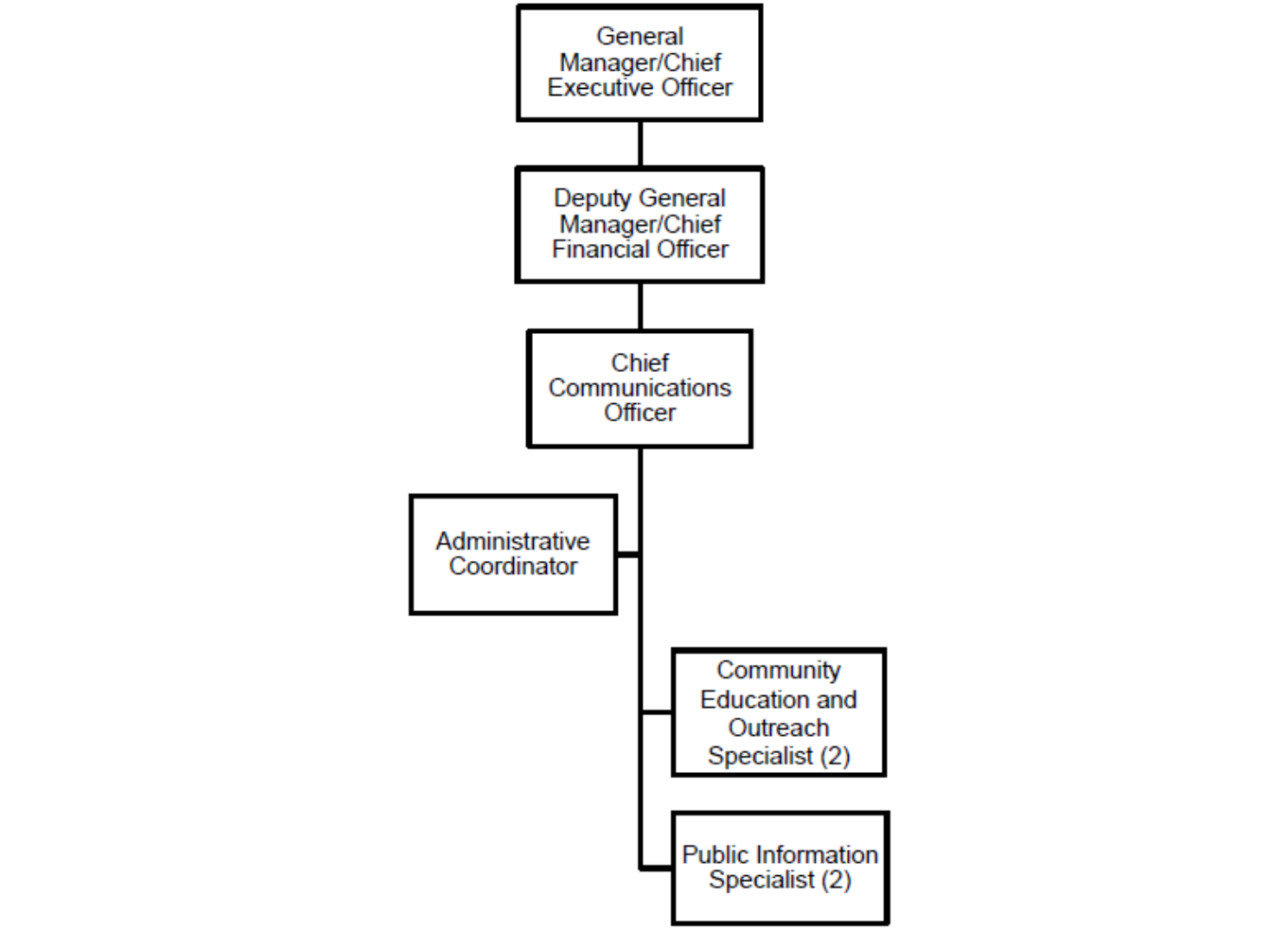


General Management Organization Chart

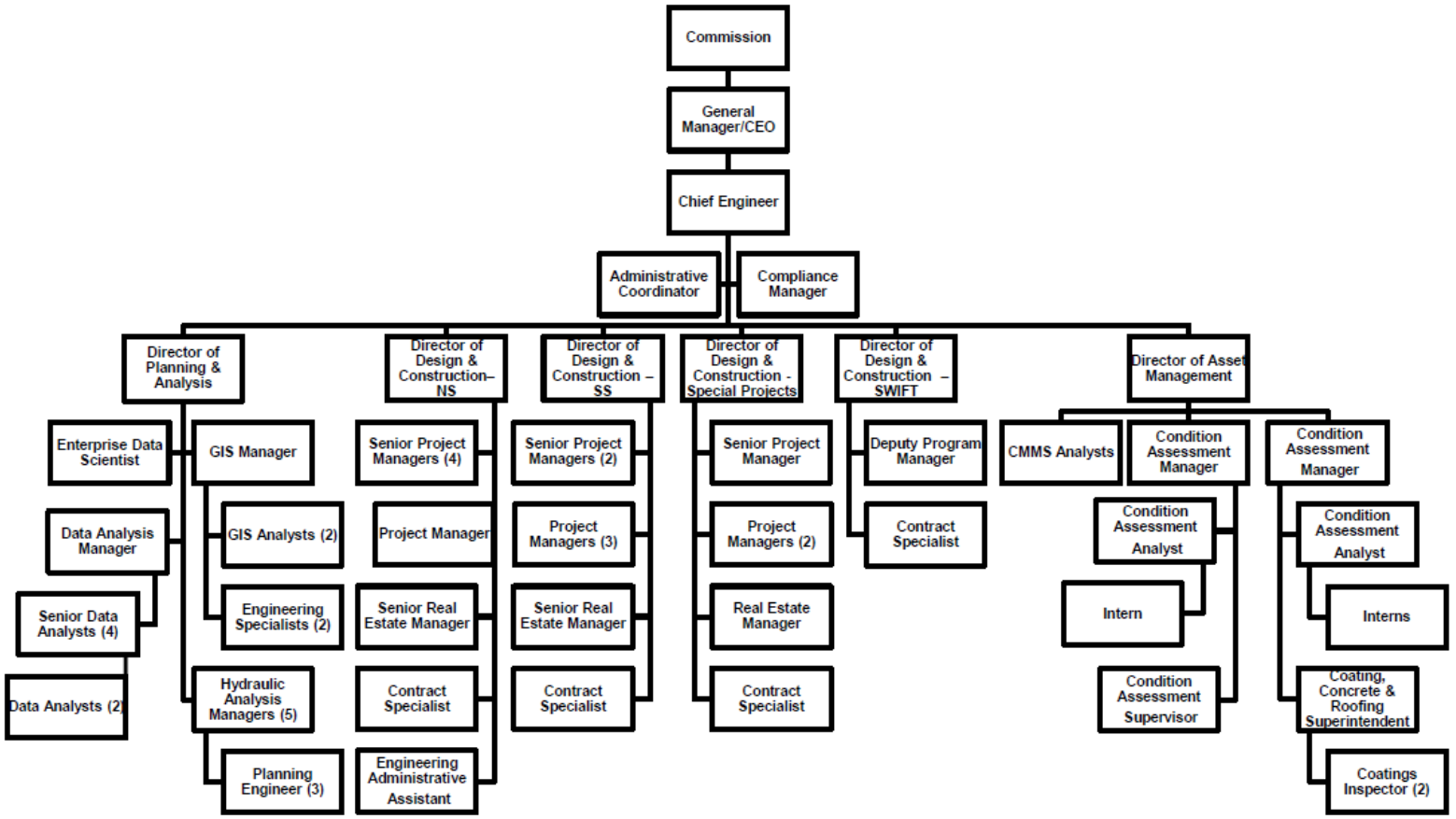
July 1, 2024



HRSD Communications Division
July 1, 2024

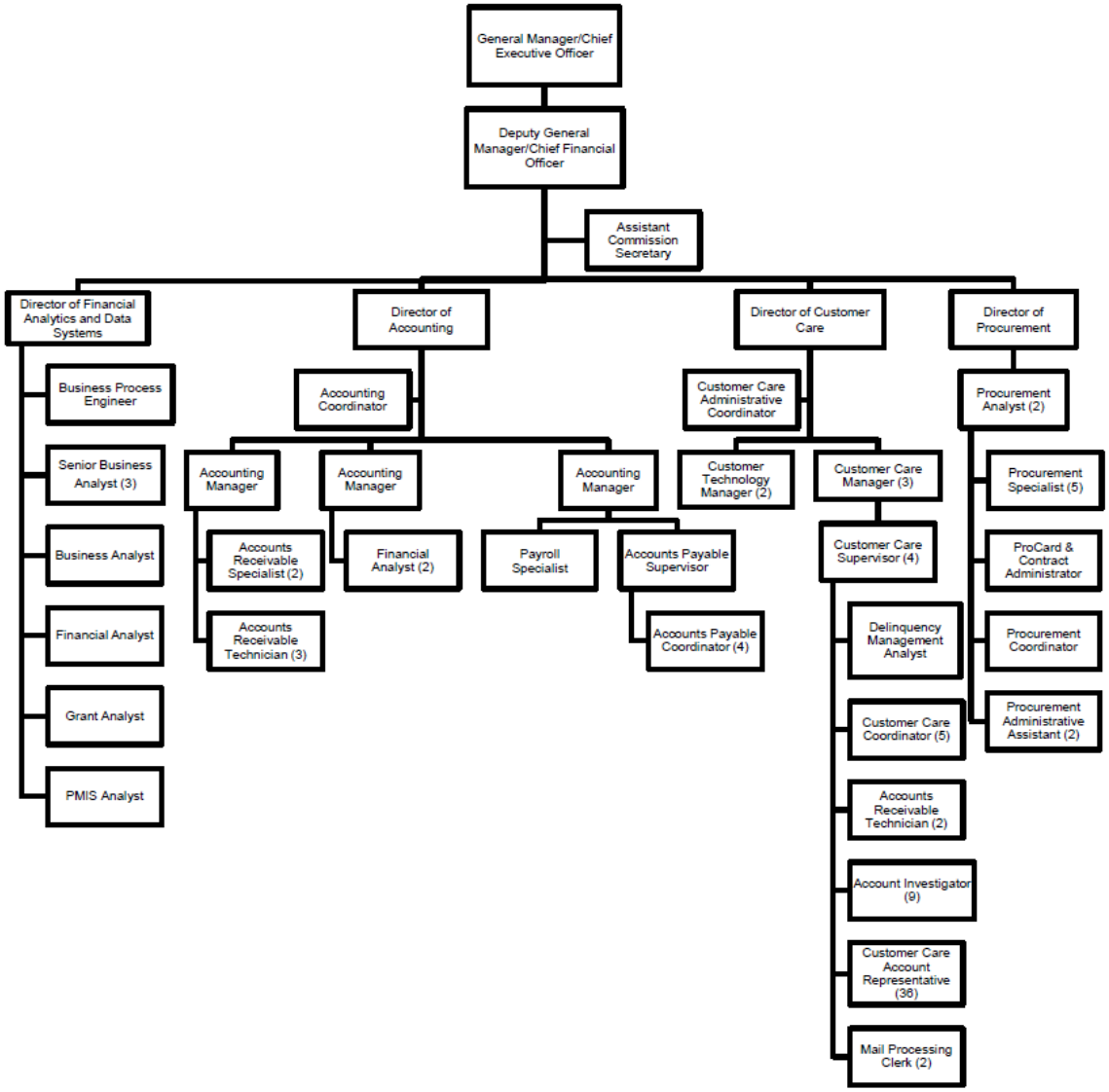


HRSD – ENGINEERING DIVISION
ORGANIZATION CHART
July 1, 2024



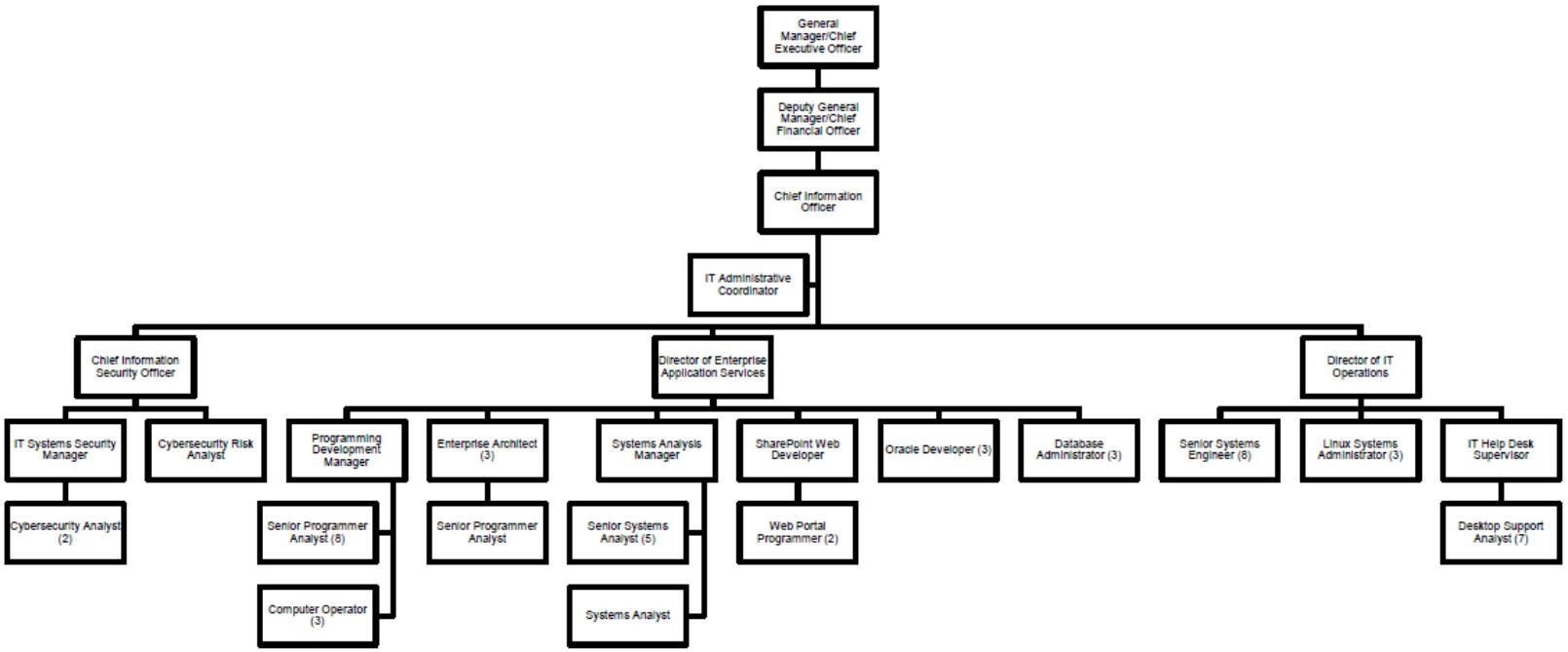
Finance Division Organization Chart

July 1, 2024



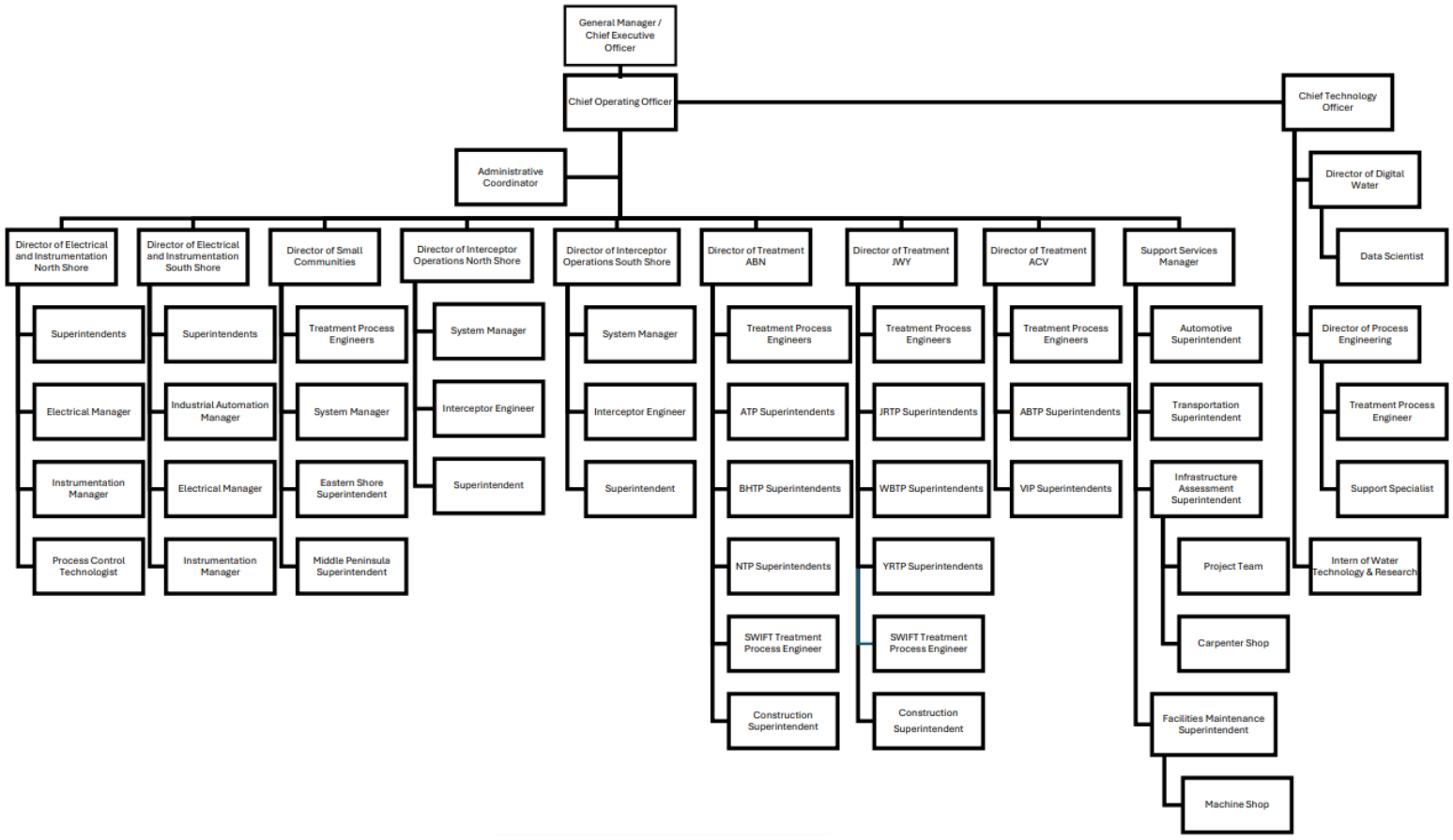
Information Technology Division Organization Chart

July 1, 2024



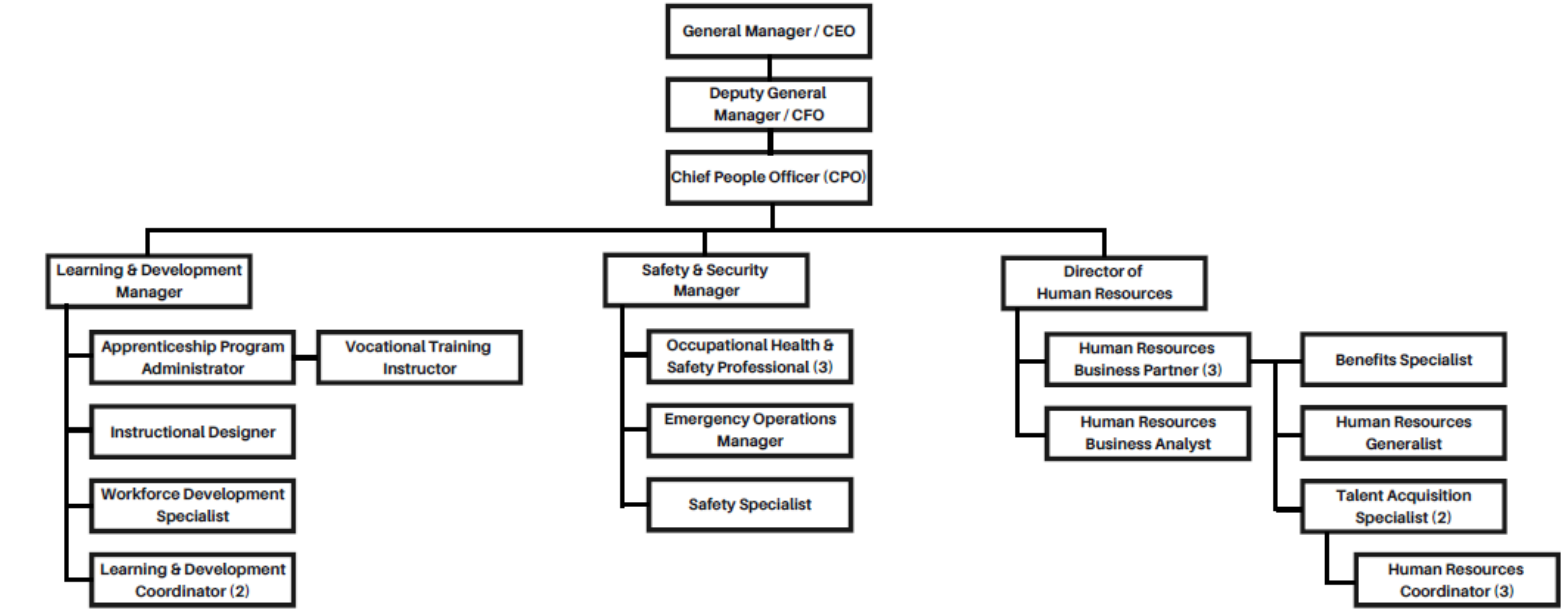
Operations Division Organization Chart

July 1, 2024



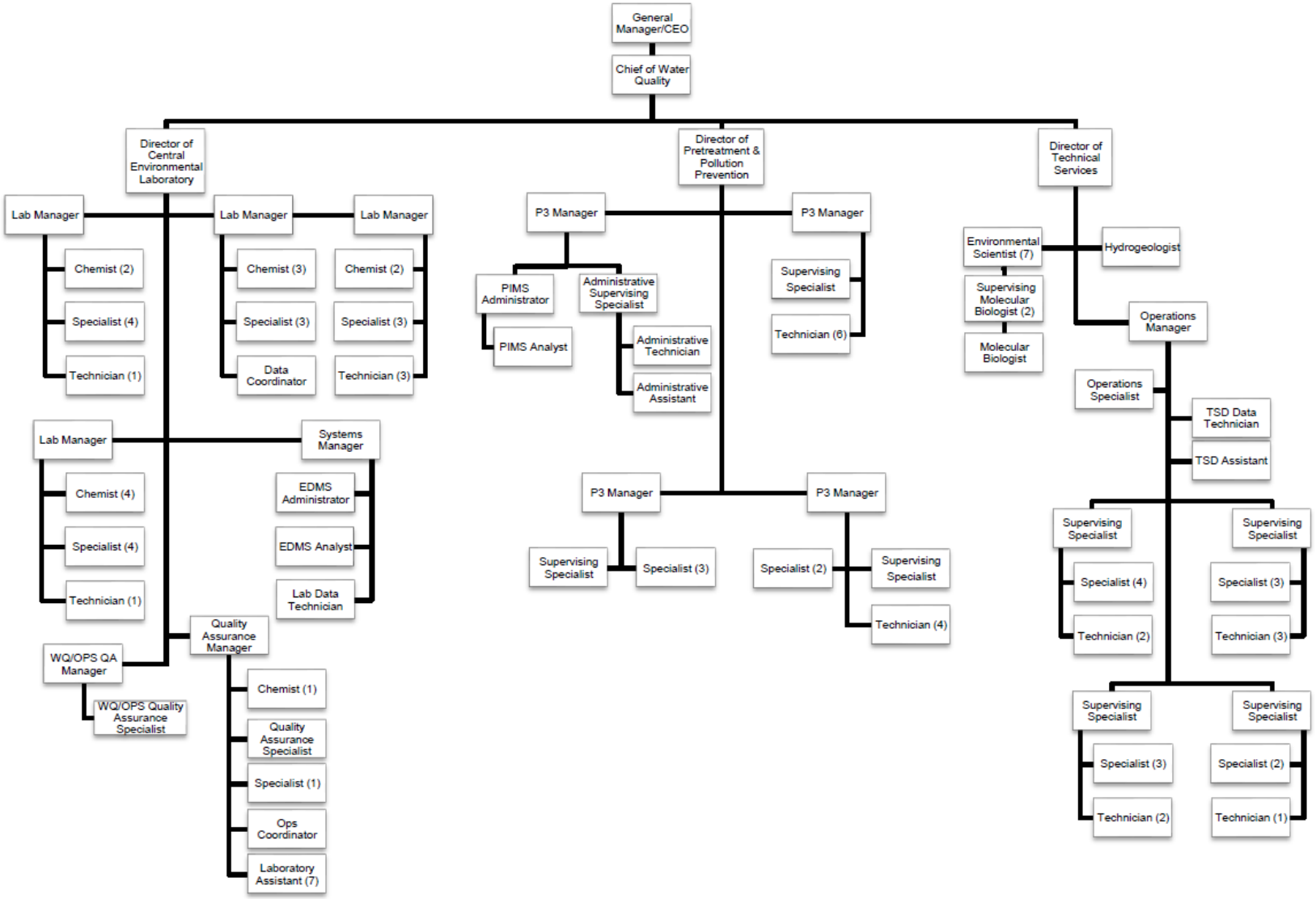
Talent Management Organization Chart

July 1, 2024



HRSD Water Quality Organization Chart

July 1, 2024



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APPENDIX B – INTERCEPTORS CREW ASSIGNMENT MATRICES

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Table B-1. North Shore - Personnel Assigned to Critical Maintenance Elements of MOM Program										
Resource Information		**Critical Maintenance Elements**								
Crew Information	**Equipment Information**	**Pump Stations**	**Gravity Mains**	**Manholes**	**Force Mains**	**Air Release Valves**	**Pressure Control Valves**	**Main Line Isolation Valves**	**Maintenance of Way**	**I / I Investigation**
3 Repair Crews 1 Foreman 1 Interceptor Technician 2 Heavy Equipment Operator 2 Assistants	Heavy duty truck equipped with crane, hydraulics, and repair equipment (1 per crew) ¾ ton pickup for supervising Access to variety of additional equipment on as needed basis (excavators, Backhoes, Tractors, etc.)	Annual PMs Repairs	Large scale repairs	Large scale repairs	Large scale repairs	Large scale repairs	Large scale repairs	Large scale repairs	Clearing	
1 Shops/Grounds crew 2 Equipment Technicians 1 Heavy Equipment Operator Also perform fabrication, maintenance of portable equipment, inventory management, etc. as needed	Pickup Trucks Various hand tools, welders, etc.	Repair crew support	Repair crew support	Repair crew support	Repair crew support	Repair crew support	Repair crew support	Repair crew support		
4 Pump Station Crews 1 Interceptor Technician 1 Assistant	¾ Ton Truck Various hand tools	Light maintenance General repair Daily, weekly, monthly, and semi-annual PMs Scrubber PM								
2 Vac Truck Crews 1 Interceptor Technician 1 Heavy Equipment Operator	Vacuum Truck (1 per crew)	Wet well cleaning	Cleaning Repair crew support	Repair crew support	Repair crew support	Repair crew support	Repair crew support	Repair crew support		
3 Interceptor Crews 1 Interceptor Technician 2 Assistants	Crew crab truck equipped with hydraulics and tools for ARVs, etc.		Support on repairs	Support repairs	Vault inspections Support on repairs	PMs Exercise Repairs	PMs Exercise	PMs Exercise	Maintenance and cleaning	
1 Locator Crew 1 Interceptor Technician	Locating equipment Utility truck									

Updated 6/25/2024

Table B-2. South Shore - Personnel Assigned to Critical Maintenance Elements of MOM Program										
Resource Information		**Critical Maintenance Elements**								
Crew Information	**Equipment Information**	**Pump Stations**	**Gravity Mains**	**Manholes**	**Force Mains**	**Air Release Valves**	**Pressure Control Valves**	**Main Line Isolation Valves**	**Maintenance of Way**	**I / I Investigation**
Inventory/Field Support Crew 1 Interceptor Technician 1 Heavy Equipment Operator	Pickup truck	Support	Support	Support	Support	Support	Support	Support		
3 Maintenance Crews 1 Foreman 1 Interceptor Technician 3 Heavy Equipment Operators	6-person, 4-door truck with utility bed ¾-ton pickup truck for supervising Pooled equipment for backhoe, dump truck, etc.	Emergency Repairs Annual PMs	Large Scale Repairs	Large Scale Repairs	Large Scale Repairs	Large Scale Repairs	Large Scale Repairs	Large Scale Repairs		
4 Interceptor Crews 1 Interceptor Technician 2 Assistants **Additional Responsibility**: Traffic control	6-person, 4-door truck with utility bed 2 Crash trucks				PM Repairs	PM Repairs	PM Routine Maintenance	PM Repairs		
5 Pump Station Crews 1 Interceptor Technician 1 Assistant	Pump Station Route Vehicle	Routine Maintenance, Small Repairs, Daily, Weekly, Monthly PMs Annual Small Station PMs								
2 Vac Truck Crews 1 Interceptor Technician 1 Heavy Equipment Operator	Vacuum Trucks	Wet well cleaning	Cleaning Repair crew support	Repair crew support	Repair crew support	Repair crew support	Repair crew support	Repair crew support		
4 Locator Crews 1 Miss Utility Clerk (one shared between NS and SS) 4 Utility Locators	Locating equipment Utility Locating Vehicle									

Updated 6/25/2024

APPENDIX C – PORTABLE PUMP DEPLOYMENT

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Table C-1. Emergency Portable Pumps			
Operations	**Location ***	**Quantity**	**Size**
North Shore	Bayshore PS	1	8”
North Shore	Morrison PS	1	8”
North Shore	Willard Ave PS	1	12”
North Shore	Portable	2	4”
North Shore	Portable	4	6”
North Shore	Portable	2	8”
North Shore	Portable	9	12”
South Shore	Arctic Ave PS	1	12”
South Shore	Ashland Circle PS	1	6"
South Shore	Camden Ave. PS	1	8"
South Shore	Chesapeake Blvd. PS	1	12”
South Shore	City Park PS	1	6"
South Shore	Colley Ave. PS	1	6"
South Shore	Doziers Corner PS	1	6”
South Shore	Monroe Place PS	1	8”
South Shore	Norchester St. PS	1	12”
South Shore	Park Ave. PS	1	8”
South Shore	Quail Ave. PS	1	6”
South Shore	Richmond Crescent PS	1	6”
South Shore	Rodman Ave. PS	1	12”
South Shore	Robin Hood Rd. PS	2	6”
South Shore	Robin Hood Rd. PS	2	12”
South Shore	Seay Ave. PS	1	6”
South Shore	State St.	1	12”
South Shore	Suffolk	1	10”
South Shore	Washington District PS	1	12”
South Shore	Willoughby PS	1	6”
South Shore	Portable	1	4”
South Shore	Portable	4	6”
South Shore	Portable	2	8”

**Deployment as of July 2024. Changes will be made as needs dictate.*

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APPENDIX D – SANITARY SEWER OVERFLOW RESPONSE PLAN (SSORP) SUMMARY

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HRSD SSO RP Summary Guide

Table D-1. SSO RP Contact List		
Contact	**Primary Phone Number**	**Secondary Phone Number**
Permits Manager	(757) 460-4245 (office)	(757) 419-8577 (mobile)
Department of Environmental Quality (DEQ) – Virginia Beach Office	(757) 518-2077	(757) 518-2000
Department of Emergency Management (DEM)	1-800-468-8892 (For reporting during non-business hours)	N/A

Note: A comprehensive phone directory is located in SSO RP Appendix E on hrsd.com.

SSO Reportable Release Reporting Procedure:

1. The main objectives of personnel responding to a release are to stop, contain, recover, disinfect, assess, restore, and report properly (Reference MOM Section 2.1.3).
2. If you are uncertain whether a release is reportable, contact the Permits Manager for guidance.
3. Provide the Permits Manager the First Telephone Report information (Reference SSO RP 2.5.1)

   - Site Name and Type (manhole, pump station, force main, etc.)
   - Location: Street address, City
     - Pump station, line number, or facility ID if available.
   - Date and time SSO was discovered.
   - Description and cause of problem
   - Planned action to stop and/or contain release.
   - Estimated time of stopping release
   - Estimated Flow Rate
   - Where is the Release going (storm drain, ground, etc.)? If it has the potential to reach state waters, name the receiving water.
   - SSO Cause (Capacity, infrastructure, maintenance, power loss, damage by others, third party action, other) (Reference SSO RP 1.3.5)
4. The Permits Manager will enter the information contained in the First Telephone Report into the SSORS reporting database, notifying DEQ of the event.
   a. Reportable releases must be reported to DEQ as soon as possible but no more than 24 hours from discovery of the problem.
   b. If the Permits Manager is unavailable and the SSO is a serious public health or environmental hazard threat, or the 24-hour reporting requirement is close, Operations personnel must contact DEQ.
5. Update the Permits Manager with any significant changes in status (Reference SSO RP 2.5.2)
6. A Regulatory Reporting Form must be submitted to the Permits Manager within 3 days. Reference Section 2.5.3 and SSO RP Appendix A for Final Report description and example form.
7. The Permits Manager will submit a written report to DEQ within 5 days of the beginning of the problem through the SSORS database (Reference SSO RP 2.5.4).

Non-HRSD Releases (Reference SSO RP Appendix C)

1. Contact the appropriate Operations Center and report.
2. Make every reasonable attempt to contact the owner.
3. Record the following: Location of release, Type of problem, Date/time potential SSO was discovered, Owner of the sewer facility, if known
4. Complete the non-HRSD release form and send it to the Permits Manager within three days of the problem.
5. The Permits Manager will forward the Non-District spill form to the locality.

APPENDIX E – SOFTWARE PROGRAMS

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Table E-1. Software Descriptions		
Generic Name	**Data Description**	**Specific Software Name**
Automotive Vehicle Location and Diagnostics	Fleet Assets	Fleetistics®
Building Information Modeling (BIM)	Vertical Assets	Revit by AutoDesk®
Business Intelligence (BI) Dashboards	Variety of Datasets	Microsoft PowerBI
CIP Budgeting Module	CIP Budget	Oracle Hyperion
Computerized Maintenance Management System	Asset maintenance history and life cycle costs	~~Infor EAM~~ Hexagon
Customer Care and Billing (CC&B) System	Billing System Data	Oracle Utilities
Data Historian and Historical Alarm Archives - Interceptors	Collection System Sensor Data and Alarming	OSIsoft PI® / Microsoft Access
Data Historians - Treatment	Treatment System Sensor Data	Enterprise Data Solution (EDS)
Engineering Document Management System	Engineering Documents	Adept by Synergis Software
Enterprise Resource Planning (ERP)	Business Intelligence (Financial and Human Resource Information)	Oracle E-Business Suite (EBS)
Geographic Information System (GIS)	Geospatial and Linear Assets	Esri™ ArcGIS
HRSD Intranet	Variety of Datasets	Microsoft SharePoint Online
Laboratory Information Management System (LIMS)	Laboratory Sample Management	SampleManager LIMS™ Software
Learning Management System (LMS)	Learning Environment	Instructure Canvas LMS
Pretreatment Information Management System (PIMS)	Pretreatment Information and Data	Internet-based Publicly Owned Treatment Works (POTW) Administration and Compliance System (iPACS)
Project Management Information System	Project Management Information	Oracle® Primavera Unifier (Individual CIP Projects)
Project Management Information System	Project Management Information	Oracle E-Business Suite (EBS)
Hydraulic Modeling Software	Hydraulic Conditions	Mike Urban
Replacement Planning Model (RPM)	Risk-based asset replacement schedule	Microsoft PowerBI
Risk Analysis Software (GIS-Based)	Pipeline risk data	InfoAsset by Innovyze®

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