SHORT TERM WET WEATHER OPERATIONAL PLAN (STWWOP)

Prepared for the
Hampton Roads Sanitation District

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HRSD
Cleaning wastewater every day for a better Bay.

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1. INTRODUCTION

The Hampton Roads Sanitation District (HRSD) is a regional wastewater service provider in southeast Virginia serving a geographic area of 3,100 square miles and a population of approximately 1.6 million people. It owns and operates approximately 430 miles of pressure sewer mains (and associated valves and appurtenances), approximately 50 miles of gravity sewer mains (and associated manholes, siphons, and vaults), and 81 pumping facilities which include 65 wet well pumping stations and 16 pressure reducing stations. The HRSD sanitary sewer system takes pumped flow and gravity flow from surrounding communities and transports the flows to its sewage treatment plants (STPs) with a combined treatment capacity of approximately 250 million gallons of wastewater per day. Each of the cities, towns, and counties in HRSD's service area (Localities) collects wastewater in their own sanitary sewer collection systems and sends it to HRSD's Interceptor System for conveyance to the wastewater treatment plants.

The HRSD (SS) System and the HRSD STPs have an outstanding record of performance, infrequently experiencing capacity-related overflows in most rainfall events short of an extreme weather event like a hurricane, tropical storm or nor'easter. As with any sanitary sewer system, system pressures and flows can increase dramatically during rain events.

HRSD and the Localities are developing a Regional Hydraulic Model (RHM) and Regional Wet Weather Management Plan (RWWMP). The output of this work will be to identify a Level of Service (e.g., 2-year, 5-year, or 10-year peak flow recurrence) that the system will be upgraded, as needed, to meet. The actual flow capacity requirement to meet any of these Level of Service (LOS) standards has not been determined so the ability to meet these standards is unknown. Until that LOS work is completed, HRSD and the Localities will be optimizing the existing infrastructure to limit the occurrence of sanitary sewer overflows (SSOs) and treatment plant bypasses or upsets utilizing existing assets. 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.

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2. STANDARD OPERATING PROCEDURES

2.1 Wet Weather Procedures

In most sewer systems, the typical daily peak flow rate is 50 to 60% greater than average daily flow. This flow is accommodated by the sizing of the sewer system infrastructure and is easily conveyed to the treatment plants for processing. During wet weather, the flow rate can increase to well above this level depending on the age of the system, inflow and infiltration sources, and other causes. Although most systems are designed to accommodate a portion of this increased wet weather flow, many do not have the capability of conveying the highest of the peaks.

Throughout this document the term wet weather event is used. In the context of this Short Term Wet Weather Operational Plan, this term means a rainfall event that results in peak flows that have the potential to exceed system capacity. There are many rainfall events that do not produce those levels of peak flows.

Ways to optimize the existing HRSD system can be divided into two parts: the sanitary sewer conveyance system and the treatment facilities. Each has unique challenges and opportunities to implement standard operating procedures to meet this objective.

2.1.1 Existing HRSD SS System

HRSD operates and maintains a regional interceptor system of approximately 480 miles of pipelines and 81 pumping facilities. Unlike most wastewater utilities, the HRSD system is largely a pressurized force main system of 430 miles of pipeline, with the remaining 50 miles being gravity interceptors. In either case, the goal of the conveyance system is to "keep the wastewater in the pipe." For HRSD's gravity interceptors, this is a simple goal: limit the number of SSOs. For a force main system, this means keeping the system pressures low enough to allow the HRSD and Locality pumping stations to continue to discharge their peak flows.

HRSD owns and operates pressure reducing stations (PRSs) on both the South Shore and North Shore to lower upstream pressures. However, there is a hydraulic limit as to how much wastewater can be pumped through the existing pipelines without dramatically increasing system pressures. Portions of the systems that are capacity challenged will be identified though the RWWMP; however, through operational practice, HRSD is aware of some of these locations. HRSD will review and report each pumping facility's wet weather capacity at the Pressure Policy (gpm vs. TDH) in the Preliminary Capacity Assessment Report which will be submitted to the EPA and DEQ in July 2012.

To address these capacity challenges in the short term, HRSD has installed temporary bypass pumps at several locations, adjusted operating points for PRSs, and in some limited locations can divert flow and lower hydraulic grade lines for wet weather events. These practices are described in Section 2.2.

2.1.2 Sewage Treatment Plants

HRSD operates nine major treatment plants in Hampton Roads capable of treating an annual average flow rate of 248.5 million gallons of wastewater each day. Facilities between the York River and the James River are part of the North Shore system. Facilities south of the James River are part of the South Shore system.

All of HRSD's treatment plants provide at least secondary level of treatment and several of these facilities currently provide biological nutrient removal. In 2006, the DEQ initiated new regulations that included a mass limit by river basin for both nitrogen and phosphorus. To achieve these new limits, major upgrades were required at four HRSD plants on the James River and one plant on the York River. The last of these upgrades is scheduled to be completed in early-2012 timeframe. Additional nutrient removal improvements are required to meet the Chesapeake Bay TMDL allocations. This work will be completed in phases between 2017 and 2021.

HRSD's mission is to protect public health and the waters of Hampton Roads by conveying and treating wastewater effectively. As part of this mission, HRSD strives to maintain treatment during and after a wet weather event and process as much wastewater as feasibly possible. The amount of flow that reaches a treatment plant is dependent on the wet weather conditions specific to that event. In the past, treatment plant design has been typically based on peaking factors (i.e., as found in the Sewage Collection and Transmission [SCAT] regulations [9 VAC 25-790]). As part of the RWWMP process in 2012 and 2013, HRSD will assess the capacity of the treatment facilities against flow rates determined through the regional hydrologic and hydraulic modeling process as well as against actual flows measured at each facility. HRSD will evaluate whether the modeled 2-, 5-, and 10-year peak flows (and other flow scenarios considered as part of the RWWMP) at the STPs are within the criteria for which the STPs were designed and within the peaking factors used in the design. This evaluation will be provided to the EPA and DEQ as part of the RWWMP.

After identifying the Level(s) of Service that the region can provide for wastewater conveyance and treatment, the RWWMP will propose treatment facility improvements necessary to meet that Level of Service consistent with regulatory requirements and sound engineering judgment. Out of the nine major plants, Atlantic, Chesapeake-Elizabeth, James River, Nansemond, Williamsburg and York River accept all flow sent to them. There is no influent gate to control flow and the only limitation would be the hydraulic sizing of plant piping.

Army Base, Boat Harbor and VIP pump flow sent to the plant through an influent pumping station. Army Base, Boat Harbor, and VIP maximize influent pumping rates to accept flow into the plant. Atlantic, Chesapeake-Elizabeth, Nansemond, and York River maximize effluent pumping to discharge flow from the plant.

In the period of 2005 to 2010 there have been a total of 25 reportable events related to wet weather at the 9 major HRSD STPs. A "reportable event" is an occurrence at a treatment plant that is reportable under the Virginia Pollution Discharge Elimination System (VPDES) Permit requirements. These events include a variety of circumstances including low chlorine residuals, use of permitted short outfalls, spills within the plant, weekly value exceedances, etc. Of these, 10 were associated with extreme weather events including named storms and a nor'easter, 8 were reportable chlorine residual issues that were within the allowable permit number for chlorine exceptions, one was for use of a fully permitted short outfall with fully treated effluent and two were a temporary issue related to clarifier construction. This leaves only 4 events (identified in red in Table 2-1 along with the CIP number associated with the improvement that resolved the issue) in five years, three of which have been resolved through recent construction projects and the fourth was operator error. See Table 2-1 for a description of these events.

Table 2-1. Listing of HRSD Treatment Plant Wet Weather Reportable Events

Date	Location	Description/Cause	Comments
6/14/2006	Atlantic	Low chlorine contact tank residual due to high plant flow from rainstorms. Plant flow over 71 MGD. Increased hypochlorite feed.	Low chlorine residual
9/1/2006	Army Base	Low chlorine contact tank residual due to high plant flow during Tropical Storm Ernesto. Increased hypochlorite feed.	Tropical Storm Ernesto
9/1/2006	James River	Primary clarifiers overflowed due to high plant flow from Tropical Storm Ernesto.	Tropical Storm Ernesto
9/1/2006	VIP	Short outfall used during high plant flows (>87 MGD) due to Tropical Storm Ernesto.	Tropical Storm Ernesto
9/1/2006	VIP	Pipe protruding from side of aeration tank leaked during TS Ernesto. Water level in aeration tank was higher than normal due to high plant flows.	Tropical Storm Ernesto
11/22/2006	VIP	Short outfall used due to high flows from coastal storm.	Use of the short outfall is a permitted discharge that used as part of the short term wet weather management strategy. This is fully treated, chlorinated and de-chlorinated effluent that is discharged through a permitted outfall. A reportable event but not a permit violation.
2/18/2008	Atlantic	Primary clarifier scum well overflowed during high flows.	Operator error caused discharge from improperly positioned valve during wet weather event.
12/12/2008	Boat Harbor	Low chlorine contact tank residual due to high plant flow from rain. Increased hypochlorite feed.	Low chlorine residual
6/5/2009	Ches-Eliz	Contact tank overflowed due to high plant flows from rain. Placed third effluent pump in service.	Time to open manually operated gates resulted in discharge. Since that time, the gates have been modified with automatic actuators and a lower alarm set point. Issue resolved with construction of improvements (CIP CE-101).
8/12/2009	Ches-Eliz	Contact tank overflowed due to high plant flows from rain. Placed two effluent pumps in service.	See comments for contact tank overflow on 6/5/2009. Issue resolved with construction of improvements (CIP CE-101).
8/12/2009	VIP	Plant bypass due to high plant flows from severe localized thunderstorms in area. 1.5 MG discharged.	Severe localized wet weather event (100-year recurrence interval) during construction at treatment plant. Construction work to rehabilitate the influent pumping station wet well has been completed. Issue resolved with construction of improvements (CIP VIP-137).
8/13/2009	Ches-Eliz	Low chlorine residual due to high flows from rainstorms.	Low chlorine residual
9/7/2009	York River	Low chlorine residual due to high plant flows.	Low chlorine residual

Table 2-1. Listing of HRSD Treatment Plant Wet Weather Reportable Events

Date	Location	Description/Cause	Comments
11/8/2009 to 11/14/2009	Atlantic	TSS loading average exceeded for the week due to high plant flows from nor'easter.	2009 Nor'easter
11/8/2009 to11/14/2009	James River	TSS weekly loading and concentration limit exceeded due to high plant flows from nor'easter.	2009 Nor'easter
11/12/2009	Boat Harbor	Split flow channel overflowed due to high plant flows from nor'easter.	2009 Nor'easter
11/12/2009	Ches-Eliz	Short outfall opened for high plant flows from nor'easter.	2009 Nor'easter
11/13/2009	Boat Harbor	Low chlorine residual due to high plant flows from nor'easter.	2009 Nor'easter
11/14/2009	Nansemond	Final effluent wet well overflowed briefly during high plant flows	2009 Nor'easter. Operators were manually throttling the effluent pump discharge valve to suit changes in the influent flow and wet well levels. Operator was unable to react in response to change in flow and didn't throttle valve in time. Overflow entered containment pond on plant site and was returned to plant system.
12/6/2009 to 12/12/2009	Ches-Eliz	TSS weekly loading average exceeded due to plant upset from high flows.	Temporary construction issue (plant improvement for BNR) resulted in high TSS due to clarifier being out of service during wet weather event. Construction work is completed and issue is addressed (CIP CE-101).
12/9/2009	Ches-Eliz	Aeration tanks overflowed briefly due to high plant flows from rain.	Temporary construction issue (plant improvement for BNR) resulted in discharge from aeration tank due to clarifier being out of service during wet weather event. Construction work is completed and issue is addressed (CIP CE-101).
12/9/2009	Ches-Eliz	Low chlorine residual due to high flows from rain.	Low chlorine residual
2/6/2010	Army Base	Low chlorine contact tank residual due to high plant flow from rainstorm. Increased hypochlorite feed.	Low chlorine residual
3/3/2010	Boat Harbor	Low chlorine residual. Plant flow was about twice the normal rate for that time of day due to nor'easter storm. Placed second contact tank in service and adjusted hypochlorite feed rate but still got a low residual. Increased feed rate again.	Low chlorine residual
3/29/2010	James River	Three consecutive low chlorine residuals due to high plant flows caused by heavy rain.	Low chlorine residual

Table 2-1. Listing of HRSD Treatment Plant Wet Weather Reportable Events

Date	Location	Description/Cause	Comments
9/30/2010	Ches-Eliz	Plant opened alternate outfall 002 to prevent process tank overflows due to high plant flows during heavy rain. Plant flow rate exceeded 60 MGD.	Severe wet weather event greater than 50-year recurrence interval
9/30/2010	James River	Pre-aeration tanks #2 and #3 and primary clarifiers #3 and #4 overflowed due to high flows from an extreme rain event. The plant is undergoing construction for nutrient removal upgrades and not all of the unit processes were available. Most of the overflows came from the pre-aeration tanks.	Severe wet weather event greater than 50-year recurrence interval

This level of permit compliance has been achieved through significant efforts in maintaining and operating the treatment facilities in preparation for wet weather events. The following general standard operational plan (SOP) has been developed to assist individual plant managers in addressing wet weather events. Several of the plants have also developed their own plant-specific wet weather procedures (included in Appendix A) that complement the general SOP. The remaining five facilities manage peak flows using the general SOP and do not require a plant-specific SOP.

General Procedures

- Conduct an aggressive preventive maintenance (PM) program, to maximize available equipment and tanks during wet weather events.
- Make provisions for additional personnel to be on call or preferably on-site during the wet weather event. This only applies to significant weather events with known, long preparation time (e.g., a hurricane).
- 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 the event.

Procedures per Unit Process

Preliminary Treatment: Screening and Grit Removal

- If screens are equipped to run automatically based upon level, they may be left in the "automatic" mode.
- If screens are run based upon a timer, they should be switched to "continuous run" mode when the flow increases above the normal peak flow.

Primary Clarification

- 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.
- If aeration of biological process is reduced, reduce or halt return activated solids (RAS) pumping and discontinue waste activated solids (WAS) pumping.

Disinfection

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

2.2 Current Implementation

In order to maximize the effectiveness of the existing infrastructure, HRSD staff has identified measures which have been implemented over the years to minimize SSOs, high system pressures, and plant treatment bypasses. The following sections provide a listing of some of the measures taken to achieve this goal. HRSD operates a system with many variables including improvements occurring on a regular basis, new pipelines being installed, and additional development being added to the system. The following measures are the current approach to conveying and treating peak flows; however, as the system changes, so will the approach.

2.2.1 Sanitary Sewer Conveyance System

Within the sanitary sewer conveyance system, HRSD has available a small number of options to minimize SSOs and reduce peak system pressures outside of the normal system operation. One option, which has limited applicability, is to change the direction of flow using diversions from valve operations. The second is the use of temporary bypass pumps to deliver peak flows into a system with increased pressures. The third is through adjustment of control valves and operational settings at PRSs.

2.2.1.1 Valve Operations

Although the HRSD sanitary sewer system is connected in multiple locations between treatment plant service areas, the flexibility to send flow from one treatment plant to another is limited by practical hydraulic constraints. These connection points are typically in the extremities of the service areas and shifting flow from one location of high pressure to another is not beneficial. There are also cases where pipelines have limited ability to accept more flow due to their existing size or condition. Some of these cases will be improved through the Interim System Improvements as detailed in the Amended Consent Decree, although the amount of benefit is unknown until the Level of Service (LOS) is identified in the Regional Wet Weather Management Plan. These projects include:

- YR104 and 108, Kiln Creek and Route 171 Interceptor Force Mains. This project on the North Shore to allow the transfer of flow from Poquoson away from Big Bethel PRS and the York River Treatment Plant, and shift it to the west and the James River Treatment Plant; and

- AT-113-2, Lake Ridge IFM Section B. This project on the South Shore allows flow to be rerouted to the southern approach to the Atlantic Treatment Plant, avoiding the more heavily used pipeline from Kempsville PRS to the Atlantic PRS.

Some of the valve operations that HRSD employs involve the smaller pumping stations that do not have the ability to pump against higher system pressures. In the Larchmont area of Norfolk, two pumping stations (Jamestown Crescent PS and Hanover PS) usually discharge into a common force main with Monroe PS. During peak flow conditions, the smaller stations are diverted from the pressurized system into the gravity collection system of Monroe PS which has more powerful pumps. After the peak flows have receded, the valving is reversed to return the two smaller pumping stations to the force main system.

In the northeast area of Virginia Beach, HRSD has the ability to shift flows from the Atlantic Treatment Plant to the Chesapeake-Elizabeth Treatment Plant using the valve at John B. Dey.

2.2.1.2 Bypass Pumping

HRSD has utilized temporary bypass pumping at several of its pumping station where the existing pumps have been identified as insufficient and the future size needed is dependent upon the results under development in the Regional Wet Weather Management Plan. Temporary pumping has been utilized as shown in the following table; however, HRSD Operations and Engineering may determine that the bypass pumps could be better utilized in an alternate location and have them moved.

Table 2-2. HRSD Temporary Emergency Bypass Pump Locations

Station #s	Station Names	Pump Size
101	Arctic	8"
102	Ashland Circle	6"
105	Chesapeake Blvd	6"
105	Chesapeake Blvd	12"
106	City Park	6"
107	Colley Avenue	6"
109	Dozier's Corner	6"
113	Luxembourg Avenue	8"
114	Monroe Place	6"
116	Norchester Street	8"
119	Park Ave	6"
124	Richmond Crescent	6"
124	Richmond Crescent	6"
125	Seay Avenue	6"
127	State Street	8"
135	Suffolk	12"
145	Rodman Avenue	12"

Table 2-2. HRSD Temporary Emergency Bypass Pump Locations

Station #s	Station Names	Pump Size
146	Camden Avenue	12"
147	Chesterfield Blvd	6"
207	Center Avenue	8"
217	Langley Circle	12"
223	Washington Street	6"
225	Willard Ave	12"
	Victoria Blvd (new facility at location of City of Hampton PS 1)	12"

This deployment represents a snapshot in time and will be changed in the future as conditions dictate. The location and use of each bypass pump is recorded and made part of the Regional Hydraulic Model as necessary to appropriately simulate the pumping conditions at each site. In addition, HRSD owns several portable pumps that are available to deploy as situations demand. This includes five 4" pumps (3 South Shore and 2 North Shore), nine 6" pumps (5 South and 4 North), three 8" pumps (2 South and 1 North), one 10" pump (South), and five 12" pumps (4 South and 1 North). Use of these pumps is also recorded and incorporated into the RHM, when appropriate.

2.2.1.3 Operational Settings

The HRSD sanitary sewer system is comprised of gravity interceptors, pumping stations, force mains, pressure reducing stations, and pressure control valves (PCVs). HRSD can use its PRSs and PCVs to lower the hydraulic grade line in upstream portions of the system.

2.2.1.3.1 Pressure Control Valves

HRSD operates pressure control valves at:

- Route 199;
- Wolf Trap;
- Windsor; and
- Williamsburg.

These valves maintain a preset, higher hydraulic grade line in the portions of the system with rolling terrain to eliminate vacuum conditions at the high points in the system. The value selected at each site depends on the elevation of the highest portion of the upstream force main system. The PCVs typically have a parallel mainline valve that is kept closed to allow the PCV to control upstream system pressures. During peak flow conditions, the friction loss in the pipelines can increase to a point where the need for a PCV to maintain upstream pressures is no longer necessary. In these instances, the mainline valve may be opened if it will provide additional system capacity complementing the fully open PCV. These PCVs are automated as to open and close as pressures in the system warrant.

2.2.1.3.2 Pressure Reducing Stations

Each of the HRSD PRSs is operated using pressure settings to control the starting, speed, and stopping of the pumps. In most cases, the PRSs remain off until the discharge pressure increases to a level set point and the PRS operates attempting to maintain a suction pressure set point. The pump speed will increase and additional pumps will be activated to meet this suction pressure set point. Once the flow rate reduces to a point lower than the minimum speed pumping rate at the PRS, the PRS will de-activate until the next time it is required.

The minimum pressure used for the suction pressure set point is dependent on the elevation of the force main interceptor system. Similar to the PCV settings, the PRS is programmed to not create vacuum conditions by reducing the hydraulic grade line below the elevation of the force main. HRSD has the ability to adjust the set points during extreme, long duration peak flow events to rebalance the existing system pumping.

HRSD is also installing large, temporary bypass pumps at locations in the system to act as temporary pressure reducing stations until the LOS is selected and a permanent facility can be designed and installed. Planning is currently underway to install this solution at the (future) Wilroy PRS site to assist with lowering the hydraulic grade line in the downtown Suffolk area. Other locations included in the CIP for this approach include the (future) Elbow Road PRS site.

2.2.2 Treatment Plant Specific Actions

The following sections provide treatment plant specific details on how each location handles peak flows.

2.2.2.1 Army Base Treatment Plant

401 Lagoon Road
Norfolk, Virginia 23505
As of September 2010
Plant Manager: Brian McNamara
Phone: 757-440-2521

Table 2-3. Army Base Treatment Plant Profile

Receiving Stream	Elizabeth River
Operation Startup	1947 (11-MGD primary)
Permitted Design Flow	18 MGD
Peak Hydraulic Capacity	36 MGD
Average Daily Flow (2009)	12.27 MGD
Level of Treatment	Secondary with chemical phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bi-sulfite
Disinfection Process	Chlorination (plus de-chlorination)

This facility is designed to process an annual average flow of 18 MGD of wastewater. The facility is designed for a peak day hydraulic flow of 36 MGD. Current typical average daily flows range from 9 to 18 MGD. In the event of a power failure, the facility is equipped with an emergency diesel generator to supply full electric service to the plant.

The facility is staffed 24/7 allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to extreme weather or during wet weather based on power grid reliability.
- Based on actual hydraulic needs, place additional, available unit processes which are not in service into service:
    - Bar screens
    - Grit channels
    - Primary clarifiers
    - Aeration tank
    - Secondary clarifiers
    - Contact tank
- Based on hydraulic needs, reduce internal recycle flows, deactivate non-critical equipment or operations:

- Incinerator
- Centrifuge
- Return activate solids pumping
- Waste activate solids pumping

The facility is currently under construction of improvements to a 5-stage Bardenpho for nutrient removal. The above wet weather procedures will not be impacted when the new facility becomes operational.

2.2.2.2 Atlantic Treatment Plant

645 Firefall Drive
Virginia Beach, Virginia 234545
As of September 2010
Plant Manager: Erwin Bonatz, Jr., PE
Phone: 757-821-7402

Table 2-4. Atlantic Treatment Plant Profile

Receiving Stream	Atlantic Ocean
Operation Startup	1983 (36-MGD secondary)
Permitted Design Flow	54 MGD
Peak Hydraulic Capacity	135 MGD
Average Daily Flow (2009)	25.66 MGD
Level of Treatment	Secondary
Solids Management	Land application
Disinfection Method	Liquid sodium hypochlorite
Disinfection Process	Chlorination

This facility is designed to process an annual average flow of 54 MGD. The facility is designed for a peak day hydraulic flow of 135 MGD. Current typical average daily flows range from 25 to 34 MGD. In the event of a power failure, the facility is equipped with emergency diesel generators to supply full electric service to the plant.

The facility is staffed 24/7 allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to extreme weather or during wet weather based on power grid reliability.
- Based on actual hydraulic needs, place additional, available unit processes which are not in service into service:
    - Bar screens
    - Grit removal tanks
    - Primary clarifiers
    - Aeration tanks
    - Secondary clarifiers
    - Contact tanks

- Based on actual hydraulic needs, reduce internal recycle flows, deactivate non-critical equipment or operations:
  - Centrifuges
  - Return activated solids pumping
  - Waste activated solids pumping

2.2.2.3 Boat Harbor Treatment Plant

300 Terminal Avenue
Newport News, Virginia 23607
As of September 2010
Plant Manager: Christel Dyer
Phone: 757-244-1671

Table 2-5. Boat Harbor Treatment Plant Profile	
Receiving Stream	James River (lower)
Operation Startup	1948 (12-MGD primary)
Permitted Design Flow	25 MGD
Peak Hydraulic Capacity	50 MGD
Average Daily Flow (2009)	15.10 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)

This facility is designed to process an annual average flow of 25 MGD. The facility is designed for a peak day hydraulic flow of 50 MGD. Current typical average daily flows range from 10 to 20 MGD. In the event of a power failure, the facility is equipped with an emergency diesel generator to supply full electric service to the plant.

The facility is staffed 24/7, allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to extreme weather or during wet weather based on power grid reliability.
- Based on actual hydraulic needs, place additional, available unit processes which are not in service into service. This may include:
  - Grit channel
  - Primary clarifier
  - Aeration tank
  - Secondary clarifier
  - Contact tank
- Based on actual hydraulic needs, reduce internal recycle flows, deactivate non-critical equipment or operations:
  - Return activated solids pumping

- o Waste activated solids pumping
- o Centrifuge

2.2.2.4 Chesapeake – Elizabeth Treatment Plant (CETP)

5332 Shore Drive
Virginia Beach, Virginia 234555
As of September 2010
Plant Manager: Jeffrey Lane
Phone: 757- 318-3601

Table 2-6. Chesapeake-Elizabeth Treatment Plant Profile

Receiving Stream	Chesapeake Bay
Operation Startup	1968 (8-MGD secondary)
Permitted Design Flow	24 MGD
Peak Hydraulic Capacity	60 MGD
Average Daily Flow (2009)	21.10 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination plus dechlorination

The CETP underwent a major upgraded in 2005 to 2007. New construction cost approximately $35 million and included new headworks with center flow band screens and forced vortex grit removal systems, new aeration influent and effluent channels, new secondary clarifiers, and two new RAS pump stations.

This facility is designed to process an annual average flow of 24 MGD. The facility is designed for a peak day hydraulic flow of 60 MGD. Current typical average daily flows range from 16 to 20 MGD. In the event of power failure the facility is equipped with an emergency diesel generator sized to operate the entire plant.

The facility is staffed 24/7 allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to or during extreme weather event based on power grid availability
- Based on actual hydraulic need, place additional, available unit processes, which are not in service, into service:
  - o Center flow band screens
  - o Grit classifiers
  - o Aeration tanks
  - o Secondary clarifiers
  - o Contact tanks

2.2.2.5 James River Treatment Plant

111 City Farm Road
Newport News, Virginia 23602
As of September 2010
Plant Manager: Robert J. Rutherford, PE
Phone: 757-833-1741

Table 2-7. James River Treatment Plant Profile

Receiving Stream	Warwick River
Operation Startup	1967 (5-MGD secondary)
Permitted Design Flow	20 MGD
Peak Hydraulic Capacity	50 MGD
Average Daily Flow (2009)	13.69 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Nutri-Green® compost
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)

This facility is designed to process an annual average flow of 20 MGD. The facility is designed for a peak day hydraulic flow of 50 MGD. Current typical average daily flows range from 11 to 15 MGD. In the event of a power failure, the facility is currently equipped with an emergency generator system connected to the all of the liquid treatment portions of the plant and not connected to the solids handling portion of the plant. When the present upgrade is complete in late 2011, the entire facility will be connected to the emergency generator system.

The facility is staffed 24/7 allowing operations to appropriately react the wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to extreme weather or during wet weather based on power grid reliability.
- Based on actual hydraulic needs, place additional, available unit processes which are not in service into service:
  - Bar screens
  - Grit tanks
  - Pre-aeration tanks
  - Primary clarifiers
  - Aeration tanks
  - Secondary clarifiers
  - Contact tanks
- Based on actual hydraulic needs, reduce internal recycle flows, deactivate non-critical equipment or operations:
  - Gravity belt thickening

- o Centrifuge
- o Return activated solids pumping
- o Waste activated solids pumping

This facility is currently under construction improvement to an IFAS system for nutrient removal. The above wet weather procedures will not be impacted when the new facility becomes operational.

2.2.2.6 Nansemond Treatment Plant

6909 Armstead Avenue
Suffolk, Virginia 23435
As of September 2010
Plant Manager: William Balzer, PE
Phone: 757-638-7361

Table 2-8. Nansemond Treatment Plant Profile	
Receiving Stream	Hampton Roads/James River
Operation Startup	1983 (10-MGD secondary)
Permitted Design Flow	30 MGD
Peak Hydraulic Capacity	75 MGD
Average Daily Flow (2009)	18.28 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Incineration at another plant site (ash recycled for construction fill)
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)

This facility is designed to process an annual average flow of 30 MGD. The facility is designed for a peak hydraulic flow of 75 MGD. Current typical average flow rates range from 15 to 18 MGD. In the event of a power failure, the facility is equipped with emergency diesel generators to supply full electric service to the plant.

The facility is staffed 24/7 allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Proactively switch to emergency generator power prior to extreme weather or during wet weather based on power grid reliability.
- Based on actual hydraulic needs, place additional, available unit processes into service:
  - o Bar screens (automatic and manual)
  - o Grit channels
  - o Primary clarifiers
  - o Anaerobic/Anoxic/Aerobic tanks
  - o Aeration tanks
  - o Secondary clarifiers
  - o Contact tanks

 - o Equalization/holding pond
 - o Effluent pumping
- Based on actual hydraulic needs, reduce internal recycle flows, deactivate non-critical equipment or operations:
 - o Centrifuge
 - o Nitrified recycle solids
 - o Return activated solids
 - o Waste activate solids

The facility is currently under construction improvement to a year round biological nitrogen removal process. The above wet weather procedures will not be impacted when the new facility becomes operational.

2.2.2.7 Virginia Initiative Treatment Plant

4201 Powhatan Avenue
Norfolk, Virginia 23508
As of September 2010
Plant Manager: Sami Ghosn, PE
Phone: 757-440-2501

Table 2-9. Virginia Initiative Plant (VIP) Profile	
Receiving Stream	Elizabeth River
Operation Startup	1948 (20-MGD primary, formerly the Lamberts Point Plant)
Permitted Design Flow	40 MGD
Peak Hydraulic Capacity	80 MGD
Average Daily Flow (2009)	34.44 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bi-sulfite
Disinfection Process	Chlorination (plus de-chlorination)

This facility is designed to process an annual average flow of 40 MGD of wastewater. The facility is designed for a peak day hydraulic flow of 80 MGD. Current typical average daily flows range from 25 to 30 MGD. In the event of a power failure, the facility is equipped with an emergency diesel generator to supply full electric service to the plant.

The facility is staffed 24/7 allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to extreme weather or during wet weather based on power grid reliability.
- Based on actual hydraulic needs, place additional, available unit processes which are not in service into service:
 - o Bar screens

  - o Grit channels
  - o Primary clarifiers
  - o Aeration tank
  - o Secondary clarifiers
- Based on actual hydraulic needs, reduce internal recycle flows, deactivate non-critical equipment or operations:
  - o Incinerator
  - o Centrifuge
  - o Internal recycle pumping
  - o Waste pumping

2.2.2.8 Williamsburg Treatment Plant

300 Ron Springs Road
Williamsburg, Virginia 23185
As of September 2010
Plant Manager: Mike Parsons
Phone: 757-258-6441

Table 2-10. Williamsburg Treatment Plant Profile	
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 (2009)	10.14 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)

The Williamsburg Treatment Plant is permitted to handle an annual average design flow of 22.5 MGD. The facility is designed for a peak day hydraulic flow of 45 MGD. Unlike other HRSD plants, Williamsburg typically does not see as high of peak flows. In the event of a power failure, the facility is equipped with an emergency diesel generator to supply full electric service to the plant.

The facility is staffed 24/7 allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to extreme weather or during wet weather based on power grid reliability.
- Based on actual hydraulic needs, place additional, available unit processes which are not in service into service:
  - o Bar screens

- Grit channels
- Primary clarifiers
- Aeration tank
- Secondary clarifiers
- Contact tank

- Based on actual hydraulic needs, reduce internal recycle flows, deactivate non-critical equipment or operations
    - Incinerator
    - Centrifuges
    - Return activated solids pumping
    - Waste activated solids pumping
- At between 32-36 MGD, the control system automatically diverts a portion of the primary effluent flow from the intermediate treatment process to the aeration basins so the total hydraulic capacity is not limited by the intermediate pumping capacity.
- At between 32-36 MGD, open second effluent outfall that is identical to the first, to allow treated effluent out of the plant.

2.2.2.9 York River Treatment Plant

515 Back Creek Road
Seaford, Virginia 23696
Plant Manager: Andy Nelson
Phone: 757-833-1770

Table 2-11. 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 (2009)	12.38 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Nutri-Green compost/Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)

This facility is designed to process an annual average flow of 15 MGD. The facility is designed for a peak day hydraulic flow of 37.5 MGD. Current typical average daily flows range from 9 to 15 MGD. In the event of a power failure, the facility is equipped with an emergency diesel generator. The generator is sized appropriately to handle the entire plant load.

The facility is staffed 24/7 allowing operations to appropriately react to wet weather events. Depending on the event, operating options include:

- Switch to emergency generator power prior to extreme weather during wet weather based on power grid reliability. The entire plant is backed up by emergency power except for the centrifuge building which has limited operation of 10 to 12 hours per day for 5 days per week.
- Based on actual hydraulic needs, place additional, available unit processes which are not in service into service:
    - Bar screen
    - Grit channels
    - Primary clarifier
    - Aeration tank
    - Secondary clarifier
    - Contact tank
- Based on hydraulic needs, reduce internal recycle flows, deactivate non critical equipment or operations:
    - Centrifuge
    - Return activated solids
    - Waste activated solids

The facility is currently under construction to comply with nutrient requirements. The wet weather procedures will not be impacted when the new facility becomes operational.

2.3 Measures to Improve Procedures

As discussed previously in this plan, the performance of the HRSD system is highly variable for different wet weather events based on ongoing construction projects, diversions in place for condition assessment activities, and other system configuration issues. Depending on these issues, the available and appropriate procedures for peak flow management can change.

The Interceptor Systems Chiefs and Treatment Plant Managers continually evaluate the state of the HRSD system to understand the available procedures. Following major peak flow events, the performance of the system is evaluated by reviewing system pressures, HRSD pumping facility performance, and treatment plant performance. Opportunities for improvement are identified to be used in future wet weather events. This may include the addition of a temporary bypass pump, changing pumping facility operational settings, or adjusting the responses taken at a treatment plant.

HRSD has a network of pressure sensors, flow meters, and rain gauges. Following each significant rainfall event, a post-storm analysis is produced by the HRSD Data Analysis Section. This document identifies the following:

- recurrence interval for the rainfall event by rain gauge
- the flows at the treatment plants, including peak hour flow
- location of any capacity-related HRSD SSOs
- wind speeds and direction
- tide levels
- treatment plant flow hydrographs

Also, as described in HRSD's SSO Response Plan, each HRSD SSO is evaluated for cause and recurrence. If the SSO is recurring or is capacity related, an Action Plan is developed to minimize the potential for recurrence in the future.

HRSD will take additional actions if simple modifications can be made to better accommodate peak flows. For instance, at the Boat Harbor Treatment Plant, a limitation was identified in a specific portion of the hydraulic profile that could be addressed by a minor construction project to increase the height of a channel wall. HRSD has initiated construction of this modification. If more complicated or extensive capacity related modifications are necessary, they will be included in the RWWMP.

If an issue requires more immediate attention, HRSD can implement a study of the system to develop potential solutions. Following the November 2009 nor'easter that dramatically increased groundwater levels and system flows for a prolonged period, HRSD determined that a portion of its collection system in Hampton required more immediate action. Using available data, "quick fix" solutions including bypass pumping were developed that are an interim step until the Regional Wet Weather Management Plan is completed.

3. PLAN ANALYSIS

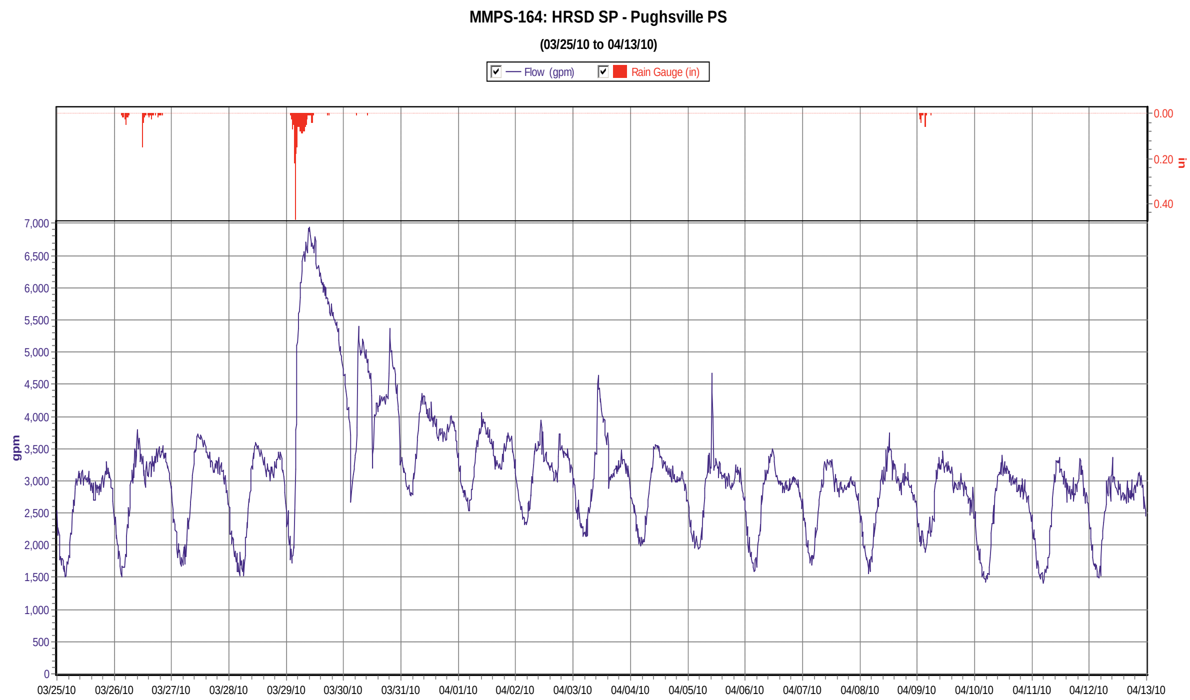
3.1 Operating Procedures for Existing Pumping Facilities

As a matter of normal operation, HRSD Interceptor Operations field personnel coordinate operation of the HRSD SS System with the Localities. During wet weather events the appropriate staff members of HRSD and the Localities remain in close communication for coordination of operational parameters to address capacity issues in the Regional SS System created by wet weather events. System capacity is maximized through coordinated operation of pump stations, pressure reducing stations, increased air venting, standby pump operation, by-pass pumping, etc. As an example, these operational procedures were memorialized with the City of Norfolk and the Virginia Department of Environmental Quality Special Order by Consent issued on March 17, 2005. A copy of the Interim Operating Plan approved for that order is included in Appendix C of this plan.

HRSD is also evaluating and developing additional wet weather operational procedures in consultation with the Localities as follows:

- For each HRSD pump station where more than one wet weather overflow (non hurricane/named storm) has occurred within the past five years, HRSD has revisited wet weather pumping capacity and station operation.
- HRSD will meet periodically with the Directors of Utilities to discuss existing wet weather operations strategies and identify any enhancements that might be beneficial.
- Continue regional coordination which occurs during wet weather events between HRSD and the Localities' operations staff.
- HRSD will work with the Localities to identify additional operational measures that can be instituted in specific areas as they are identified to further reduce the potential for SSOs in the Regional SS System. Specific focus will be on the sections of the Regional SS System related to Locality overflow points (LOPs). As appropriate, HRSD will reevaluate operational activities (including SCADA reporting and alarming protocols, pump station operating procedures, pressure reduction strategies, and redirection and/or balancing of flow) to determine if any of these strategies may be refined to further improve system performance during severe wet weather events.
- HRSD will review each of its pump station's maximum wet weather capacity through review of operating records and pump curves. HRSD has identified specific pump stations that currently have wet weather challenges and has temporarily positioned bypass pumping at these locations. These pumps will be relocated or removed based upon future system modifications and needs.

Through routine system optimization, HRSD reviews the performance of its pressure reducing stations to identify how they performed during significant wet weather events. The following two figures provide an example of the data reviewed. The first shows the flow rate hydrograph for the Pughsville PRS during the wet weather event of March 29, 2010. The second shows the performance of the PRS with the suction pressure versus the discharge pressure. In this example, the PRS successfully kept the suction pressure at the set point (approximately 2 psi) during the peak of the event while the discharge pressure increased to 30 psi.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(03/25/10 to 04/13/10)
Flow (gpm)
Rain Gauge (in)
gpm
in
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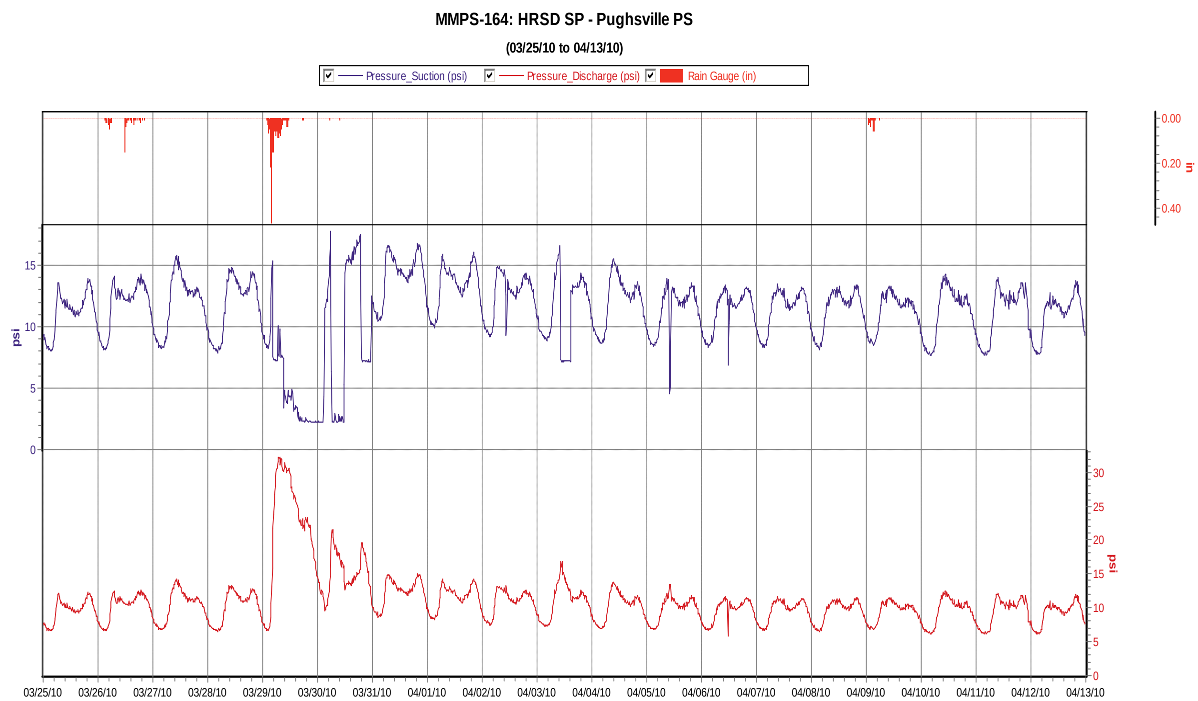
MMPS-164: HRSD SP - Pughsville PS
(03/25/10 to 04/13/10)
Pressure_Suction (psi)
Pressure_Discharge (psi)
Rain Gauge (in)
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03/25/10 03/26/10 03/27/10 03/28/10 03/29/10 03/30/10 03/31/10 04/01/10 04/02/10 04/03/10 04/04/10 04/05/10 04/06/10 04/07/10 04/08/10 04/09/10 04/10/10 04/11/10 04/12/10 04/13/10

3.2 Operating Procedures for STPs

HRSD's STPs do not throttle back flow during wet weather events. The HRSD STPs standard operating procedures discussed in Section 2 are designed to maximize the flow through the plant during various operating conditions (wet weather, plant construction and repairs, flow diversions to accommodate construction at other plants, etc.)

To assess the ability of the STPs to maximize wet weather throughput, each plant has reviewed its operating procedures to look for opportunities to modify procedures as a short-term wet weather plan element. These reviews are conducted by plant personnel and coordinated by Operations Department staff. STP procedures and strategies include making tankage available prior to storms if possible, using available spare tankage during events, and turning off or down aeration during very high peak flows to retain the biomass in the aeration tanks and avoid solids washout of clarifiers.

HRSD has reviewed the entire list of previous STP bypasses, overflows, and permit violations for the previous 5 years. As mentioned previously, there have been a total of 25 reportable events related to wet weather at the 9 major HRSD STPs. Of these, 10 were associated with extreme weather events including named storms and a nor'easter, 8 were reportable chlorine residual issues that were within the allowable permit number for chlorine exceptions, one was for use of a fully permitted short outfall with fully treated effluent and two were temporary issues related to clarifier construction. This leaves only 4 events in the previous five years, three of which have been resolved through recent construction projects and one due to operator error.

Therefore, HRSD's STPs have limited wet weather issues; however, HRSD continues to conduct routine analysis of plant performance following each significant wet weather event when capacity related issues occur.

3.3 Pressure Protocols

HRSD maintains a Pressure Policy where a specific value is assigned to each portion of the system based on elevation and treatment plant service area. This value was developed to provide expected pressures at connections and Localities with a typical hydraulic grade line for peak flow conditions within the level of service that HRSD currently provides. This value provides HRSD with a reference point to base system improvements and capacity increases. Pressure protocols do not affect capacity after infrastructure is built. HRSD uses the available infrastructure to the maximum extent feasible regardless of the policy pressure.

With the upcoming completion of the Regional Hydraulic Model, the Preliminary Capacity Assessment, and the Regional Wet Weather Management Plan, HRSD will be analyzing its Pressure Policy (uniform at the treatment plant level) and may be shifting to a specifically developed hydraulic grade line for each force main in its system. The hydraulic grade line will be available from the RHM for average daily flows and for the peak pressures during the selected Level of Service flows. HRSD will coordinate with Localities to develop long-term pressure protocols based on the hydraulic grade line for the applicable infrastructure and will formalize these with the Localities within one year of approval of the RWWMP.

3.4 Balancing Flows

As discussed in Section 2, balancing of flows within the HRSD system is practiced in very limited areas where it is possible. These transfers are limited in nature and are based on specific needs usually related to construction and emergency repairs. Large diversions are not made during specific wet weather events but rather are planned around other activities such as construction. Following wet weather events, HRSD staff reviews system pressures and available capacities to identify potential flow transfer opportunities.

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4. RESPONSE TO SMALL, INTENSE STORMS

The potential to optimize the Regional SS System response to small, intense storms is very limited. Such a response requires sophisticated weather monitoring equipment and a much higher degree of interconnection with automated system controls that currently do not exist but may be identified as potential solutions in the RWWMP. Currently, the practices identified earlier in this plan offer the best opportunity to react to localized intense storms. HRSD will work with the Localities during the development of the Capacity Assessment and the RWWMP to further identify operational changes and strategies that may, if feasible, further minimize capacity-related SSOs in the Regional SS System during localized wet weather events.

HRSD coordinates with Localities on an event specific basis. HRSD offers assistance to Localities in the form of manpower, equipment, supplies and materials, when requested. No similar formalized plans exist parallel to the Norfolk plan discussed in Section 3; however, coordination between Operations staff at HRSD and the Localities continues to identify areas for improvement.

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5. TRAINING AND MAINTENANCE OF PLAN

This section of the document describes the plan review, approval and update process, and the training program.

5.1 Plan Review, Approval, and Update

The STWWOP document will be reviewed as people, processes and systems change. Review of the plan will typically be on an annual basis, unless a significant change in wastewater system staff, internal and external contacts, or roles and responsibilities occurs. The plan revision will be dated for a specific publishing date with an increasing revision number. Minor revisions are indicated with an increase in the decimal place (e.g., 1.1, 1.2, and 1.3) and major revisions are indicated with an increase in the integer place (e.g., 1.0, 2.0, and 3.0).

5.2 HRSD Apprenticeship Program

In addition to normal safety training, HRSD has established an Apprenticeship Program. HRSD created the nation's first wastewater industry apprenticeship program to perpetuate excellence in its workforce. The apprenticeship programs (Plant Operator, Maintenance Operator, Interceptor Technician, Instrument Specialist, Electrician, Equipment Technician, and Carpenter) are custom-designed to help individuals achieve the training and experience needed for a successful HRSD career. Apprentices can receive a training increase and a merit increase each year. Operator apprentices obtain the skills and credits needed to earn their licenses. All operator and interceptor technician positions require successful completion of the apprenticeship program as a condition of continued employment. HRSD's apprenticeship programs are a combination of on-the-job training and related classroom instruction. All can be completed in four years except the electrician's program, which requires five years.

5.3 Training

To ensure that the HRSD's personnel are effective and prepared in managing an emergency situation, 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. On-going formalized operational training is provided by HRSD's apprenticeship program. This four year accredited program is a combination of formal educational classroom instruction combined with a significant amount of on the job training (OJT). Treatment Plant Operators and Interceptor Technicians graduate from this program with a 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.

5.4 Reporting

Any significant changes to the approved short-term wet weather operational strategies will be included in HRSD's annual reports per Section XVII of the Amended Consent Decree dated February 23, 2010. HRSD will consult with the Localities to review implementation of the plan and identified potential modifications or improvements.

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APPENDIX A: HRSD TREATMENT PLANT SPECIFIC STANDARD OPERATING PROCEDURES

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Wet Weather Plan
BHTP
9/22/10

When sufficient time is available prior to the on-set of the wet weather event, outstanding preventative maintenance (PM) work orders and test runs are performed on critical equipment. For some wet weather events, there is insufficient time prior to the onset of the event to complete all of the tasks listed below. In those instances, the most critical activities are performed based on the available time prior to the event. For example, a peak weather event occurring during the midnight shift, where only 2 staff is on plant site, it may take an hour or two to get additional plant staff on site.

Emergency Generators

- Verify that the generators have had their maintenance runs and PM's have been completed; check fuel levels and top off, if possible.

Influent Pumping

- Verify that all three influent pumps are included in the PLC program and are in the "Automatic" mode.

Screening/ conveyor/ compactor

- Verify both automatic screens have been PM'd (preventative maintenance) and test run for proper operation.
- Verify that the conveyor has been PM'd and test run for proper operation.
  - Verify that there are at least two wheel barrels available in good condition as a contingency should the conveyor fail.
- Verify that the HYCOR Press has been PM'd and test run for proper operation.

Grit Removal

- Verify both grit tanks have been PM'd.
- Confirm that ample grit/ screening dumpster volume is available.
- Confirm that the dumpster pick-ups are scheduled to meet needs.
- Remove the Hycor Grit Washer from operation when both grit tanks are in operation.
- Verify that adequate staff is available to handle the grit accumulation.

IPS

- Confirm that all four IPS pumps have been PM'd and test run for proper operation.
- Verify that both radar and bubble level channel controllers are working.
- Verify that the "HIGH LEVEL" effluent channel alarm is working.

Aeration Tanks

- Check that all available (operational) aeration tanks are put in service as needed.
- Verify that all four RAS pumps have been PM'd and test run for proper operation.
- Verify that the aeration tank influent flows are balanced with each other.
- Review and adjust or secure WAS flow as needed.

Secondary Clarifiers

- Check that all available (operational) secondary clarifiers are put in service, as needed.
- Confirm that adequate volumes of polymer are available for attempted solids blanket control.
- When required, confirm that polymer is feeding three hours prior to an expected high hydraulic event.
- Verify that Ferric Chloride volumes are adequate.
- Verify the capability to feed Ferric, if needed.
- Confirm that adequate staff is available to aid the plant operator in solids blanket control by:
    - Adjusting RAS vault valve position.
    - Adjusting the influent gates as needed
    - Opening the RAS ground valves as needed.
    - Verifying that the draft tubes are clear.
    - Feeding polymer as needed to designated clarifiers.

Contact Tanks

- Confirm that both contact tanks are operational. The second tank is put into service if the peak hourly flow meets or exceeds 37 MGD, or when the daily average appears as though it may exceed 24 MGD.
- Verify that the designated Hypo pumps and piping have been PM'd and are ready for trouble-free service.
- Verify that adequate staff is available to assist the plant operator in placing the second contact tank into service on off hours.
- Check that the effluent NaOH pH balancing pump and controls have been checked and test run for proper operation.

Operations

- The plant staff will closely monitor all influent and effluent permit parameters.
- The plant staff will closely monitor potential spill situations and will act accordingly to mitigate and report spill incidents.
    - In the event of a process spill, the Chief Operator (CO) will report to the plant for an accurate assessment, documentation and reporting of the incident.
    - If the CO is unavailable, the Plant Superintendent (PS) will report to the plant for an accurate assessment, documentation and reporting of the incident.
    - If the PS is unavailable, the Plant Manager (PM) will report to the plant for an accurate assessment, documentation and reporting of the incident.
- The plant staff will keep the Chief of NS Treatment apprised of detrimental plant situations should they occur.

CHESAPEAKE-ELIZABETH PLANT

HIGH FLOW EVENT ST PROCESS CHECKLIST

Perform these tasks *prior to* the arrival of high flows

If a large weather event is possible for the Ches-Eliz service area, then Operator may use the internet to access current weather conditions so he/she can make preparations ***before*** high flows actually are received at the plant. (i.e., if it's pouring rain in Norfolk, but not here, it's just a matter of time before the flows increase)

Run two band screens in manual initially

Operate two rag conveyors (one for each screen)

Operate 2 grit tanks in manual using 2 pumps for each tank.

If a large storm event is forthcoming or if the plant has experienced a couple of power blips, then transfer from utility power to generator power until conditions pass

Place return pumping in individual mode for blanket control. (Do not exceed 16 MGD total return flow)

Open contact tank cross-over valve (No. 6) 4-6" and start chamber mixer and crack open alternate hypochlorite feed valve.

Arrive earlier than normal to ensure there is time to receive an effective pass down from the previous shift operator

Take these steps upon arrival and *throughout* the high flow period

Place third band screen into service

Increase frequency of secondary clarifier DTB's

Increase frequency of effluent turbidity monitoring.

If DO levels are decreasing, then increase blower amps to provide additional air to process

Adjust secondary clarifier influent gates to manage flow distribution and solids loadings as needed.

Secure secondary scum pumps when wells become flooded from high flows.

Open cross-over valve (No. 6) as needed to prevent contact tank overflows.

Run additional effluent pumps as needed to maintain effective flow control.

Open valve (No. 8) to route chlorinated secondary effluent to the effluent vault when needed for extremely high flow conditions. (Close valve to resume normal high flow operations as soon as conditions allow)

Use out of service tanks for temporary flow control during extreme high flow events.

Increased frequency of grit/rag dumpster pickups

Anticipate higher chemical demands during high flow events and make adjustments accordingly. (Hypo, bisulfite, ferric). (Use additional pumps when needed to maintain permit parameters)

In the event of severe thunderstorms, transfer plant from utility power to generator power until conditions pass.

Check sumps, basements, containment areas and plant drains more frequently than usual for flooding.

Increase frequency of routine housekeeping activities in relevant areas (grit/rag dumpsters, conveyors & drop chutes)

Maintain effective scum removal on secondary clarifiers by keeping troughs and wells free of heavy solids build up (non-flooded conditions)

Use your radio to contact the SH operator for assistance with process control adjustments through the OIT and manual operation of gate valves at the contact tank.

During prolonged events or when maintaining effective plant operations becomes unmanageable because of the increased level of monitoring and control associated with high flow events, contact standby personnel for assistance.

<u>Once the flows begin to subside</u>

Begin throttling back down on the contact tank cross-over valve (No. 6) a little at a time until it is closed. (This will likely encompass multiple shifts)

Secure hypochlorite alternate feed valve and chamber mixer once cross-over valve is secured

Put secondary scum pumps back in service as soon as well flooding has stopped

Place return pumping back into flow proportional mode when individual blanket control is no longer required

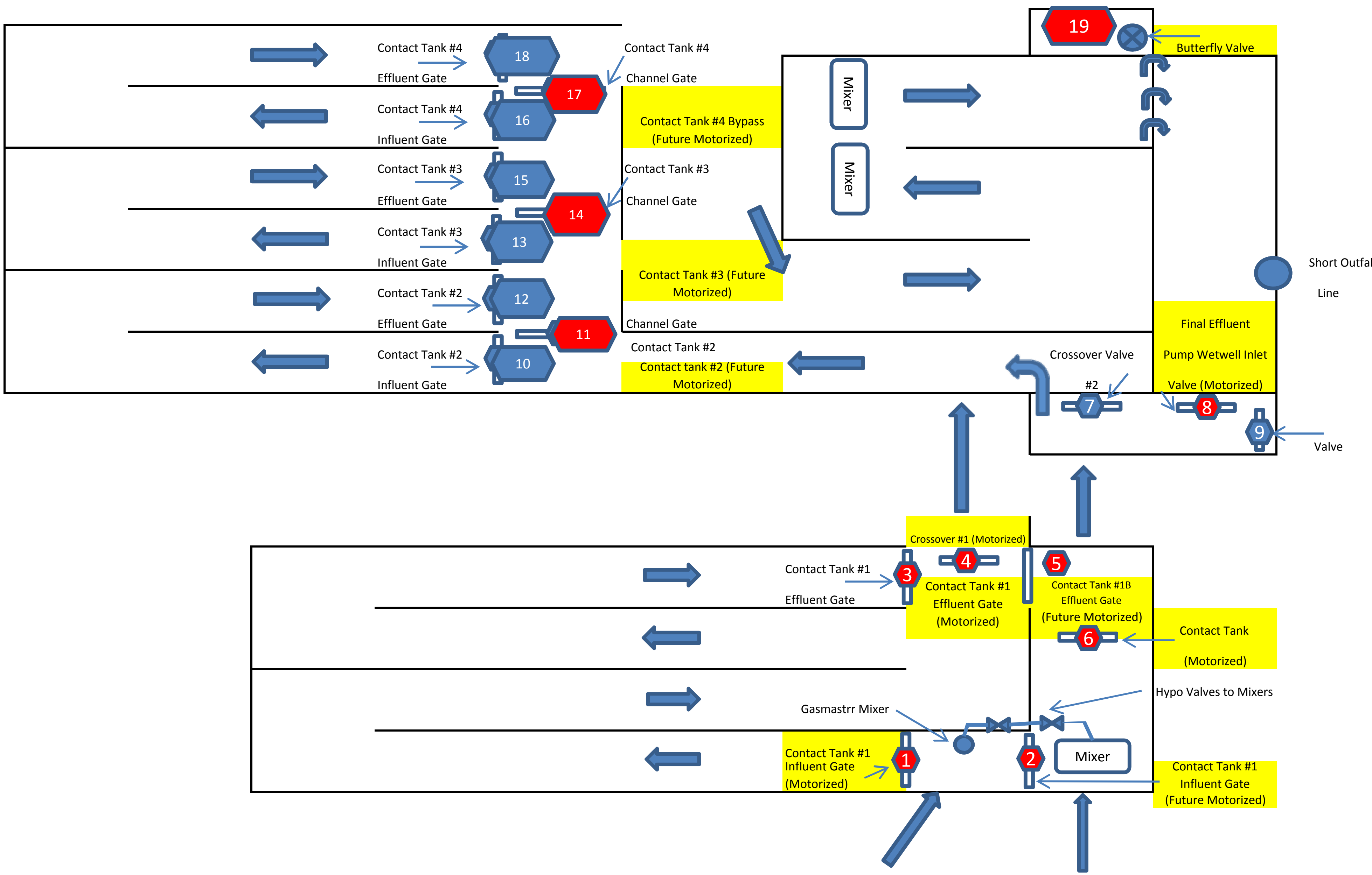
Place screening and grit equipment and controls back into normal flow condition operating modes (Stay on top of grit a & rag accumulations as higher than normal loadings usually remain for several days following these events)

Adjust chemical feeds accordingly to resume normal dosages.

Return clarifier influent gates back to normal operating conditions position.

Thoroughly document equipment and process control changes/adjustments on the plant's DPOR

Chesapeake-Elizabeth Treatment Plant



Revised 9/20/2010

James River Procedures for High Flows

21-Sep-10

Hourly Flow	Action
20 mgd	Verify influent and effluent gates on second screen are open and screen is in automatic mode.
27 mgd	Notify Lead Operator On-Call of High Flow Conditions.
31 mgd	Place eight aeration tanks in service and all available secondary clarifiers in service.
35 mgd	Put nine aeration tanks in service. Shut down centrifuge operations. Shut down GBT. Notify Supervisor.
38 mgd	Open primary clarifiers #1 and #2 diversion gate to aeration tanks.
40 mgd	Verify influent and effluent gates on third screen are open and screen is in automatic mode.
50 mgd	Shut off contact tank drain pumps, drain station pumps, and all scum pumps.

Virginia Initiative Plant Wet Weather Procedures

The Virginia Initiative Wet Weather Procedure is a guide for Plant Staff to minimize the negative impact on the treatment process, reduce overflows and bypasses during high flow conditions. The options below are available to plant personnel to be utilized based on plant conditions and additional options might be implemented.

In an effort to minimize equipment from cutting off during storms it is recommended to place the emergency generator in service. Place available tanks in service as needed to minimize negative downstream hydraulic and solids impacts, such as treatment process and overflows. Bypasses are considered the last resort in any severe weather event.

High Flows Conditions Procedures

Below are options available to plant staff to be utilized during high flow conditions. Other options might be utilized as conditions change. The below items may require additional staff during off hours . High flow conditions cannot be defined at a set rate but typically are flows in excess of 70 MGD.

- The below items can be performed in preparation for High flows:
    - Confirm adequate chemical and emergency generator fuel inventories are available for extended periods of rain or anticipated storms.

- Items that can be performed during high flow conditions, typically higher than 70 MGD:
    - Lower PC blankets.
    - Lower SC blankets.
    - Operate emergency generators.
    - Operate blower at lowest setting possible
    - Confirm that all available raw influent pumps are in service.
    - Confirm that all available bar screens are in service.
    - Confirm that all the available grit tanks are in service.
    - Utilize out of service tanks to minimize downstream on site overflows. For example, utilize the Primary Clarifiers and Aeration Tank to minimize an overflow at the secondary clarifiers. Close the Secondary Clarifier influent foam gates located at the Aeration tank effluent channels.
    - Place all available secondary clarifiers in service.
    - Reduce RAS.
    - Reduce NRCY pumping
    - Reduce ARCY pumping
    - Reduce WAS as needed
    - Start feeding polymer to the Secondary Clarifiers as needed
    - During high flow conditions it might become necessary to reduce incinerator scrubber flows to minimize influent flow while maintaining scrubber permit and not compromise equipment integrity.
    - Call for emergency grit disposal as needed.

VIP BYPASS PROCEDURES

GENERAL DESCRIPTION:

Use of the Plant Bypass Gates:

The plant bypass shall only be used in the event there is no other feasible alternative to bypassing the plant. Circumstances warranting use of the bypass include, but are not limited to, minimizing public exposure to wastewater, preventing loss of life, preventing personal injury, overflow, and minimizing severe property damage. Gates will be opened for the minimum amount of time necessary based on best professional judgment.

Normally at VIP the bypass gate is opened to prevent or stop an off-site overflow which occurs when VIP's influent junction box (JB) #2 level is at 115" or higher. During severe weather conditions the plant has experienced off-site overflows on Powhatan Ave. and adjacent public streets when the influent levels range from 115" to 120". Opening the bypass gates is based on best professional judgment with the available information.

Flow enters VIP at two junction boxes (JB), JB #1 and JB #2. The junction boxes are interconnected. Plant influent flow passes from these two junction boxes through the bar screens and into the raw influent wet well where it is pumped to downstream treatment processes. Treated flow exits the plant through the parshall flume and then to outfall 001 via JB #4. See VIP outfall diagram.

Two high level alarms provide a warning of rising water levels. The bar screen high level alarm is set at 80" and JB # 2 high level alarm is set at 90". Both alarms are indicated on the DCS. In addition, the 90" JB #2 high level alarm has a local audible horn. See Figure 1.

During a bypass condition, gates #2 and #4 can be utilized to bypass the flow around the plant. Opening gate #2 allows raw influent to bypass the plant through JB # 3 and be discharged to the head of the canal. Opening gates # 2 and # 4 allow for bypassing the plant through JB #4 and to be discharged through the effluent plant diffuser. Sodium hypochlorite (hypo) solution is added to the bypassed flow at JB #3. See VIP Outfall diagram.

BYPASS STEPS

Employees should maintain periodic contact with a supervisor when there is a potential threat of plant bypass. However, employees should follow these bypass procedures whether or not a supervisor can be reached.

CONDITION: Alarm Condition: JB #2 level between 80” and 90”

1. Confirm the high levels are real and not the result of malfunctioning bubblers. This can be accomplished by observing the water level in the bar screen room and JB #2. The levels should be noticeably higher than normal
2. Ensure that all available bar screens and raw influent pumps are in service and operating properly.
3. Contact the lead operator on call if there is a mechanical, electrical or power issue with the raw influent pumps that cannot be corrected.

<u>If high level conditions persist:</u>

1. Locate the emergency bypass hypochlorite feed hose. It is stored by the North East door (on the same side of the Hypo tanks). See Figure 2.
2. Unlock the North gate at JB #4. See Figure 3.

3. Inform SHPO of condition of plant and maintain communication as necessary.
4. Continue to monitor the water level in JB #2.

<u>CONDITION: JB #2 water level exceeds 95”</u>

1. Contact the lead operator on call or a supervisor. Provide information on the number of tanks in service, flow rate and the condition of the plant.
2. Connect the bypass disinfection system:
   - Connect one end of the hypochlorite feed hose to the bypass disinfection valve located at hypo tank #3 manifold. See Figure 4.
     Note: The bypass disinfection valve will be opened only if an actual bypass is necessary. At this stage ensure the bypass disinfection valve is closed.
   - Insert the other end of the hose through the pipe at JB #3. See Figure 5.
   - Verify the hypo tanks discharge valves of the empty or out of service tanks are closed. Then open the discharge valves of the hypo tanks containing hypo. See Figure 6.
   - Open hypo tanks manifold valves. See Figure 7.
3. Request assistance from SHPO as needed.

<u>CONDITION: JB #2 water level is greater than 110” and prior to bypassing:</u>

1. Feed hypo to JB #3 by opening the bypass disinfection valve located at hypo tank #3. See Figure 4.
2. Document the time Hypo feed was begun and ended.

CONDITION: JB #2 water level is equal or greater to 115”

1. Open JB # 2 bypass gate. See Figure 8.
2. Document the time the bypass gate was opened.
3. Maintain the water level in JB #2 between 110” - 115” by adjusting JB#2 bypass gate. If water level in JB # 2 drops below 110” refer to “Bypass Condition Ends”.
4. Open JB #4 bypass gate if directed by supervisor. See Figure 9.
5. Regulate JB #2 bypass gate to maintain the level below 115” thus minimizing the bypassed flow.

CONDITION: JB #2 water level decreases below 110”

1. Discontinue bypass when the JB #2 level decreases below 110” and is in a downward trend.
2. Close JB #2 bypass gate. See Figure 8.
3. Close JB #4 bypass gate, (if gate was opened) . See Figure 9.
4. Secure hypo feed to JB #3 by closing the bypass disinfection valve at tank #3. See Figure 4.
5. Close the discharge valves of the hypo tanks previously opened. Note: Do not close all of the discharge hypo valves in an effort to insure that hypo can be fed for disinfection. See Figure 6
6. Document time bypass gate #2 is closed.

CONDITION: Post Bypass:

1. Notify Supervisor and DEQ.
2. File an RRP for the bypass event. Be sure to follow instructions in the RRP SOP manual carefully.
3. Lock the North gate.
4. Disconnect hose
5. Add note in comment sheet to clean and inspect hose utilized to feed hypo.

Figure 1

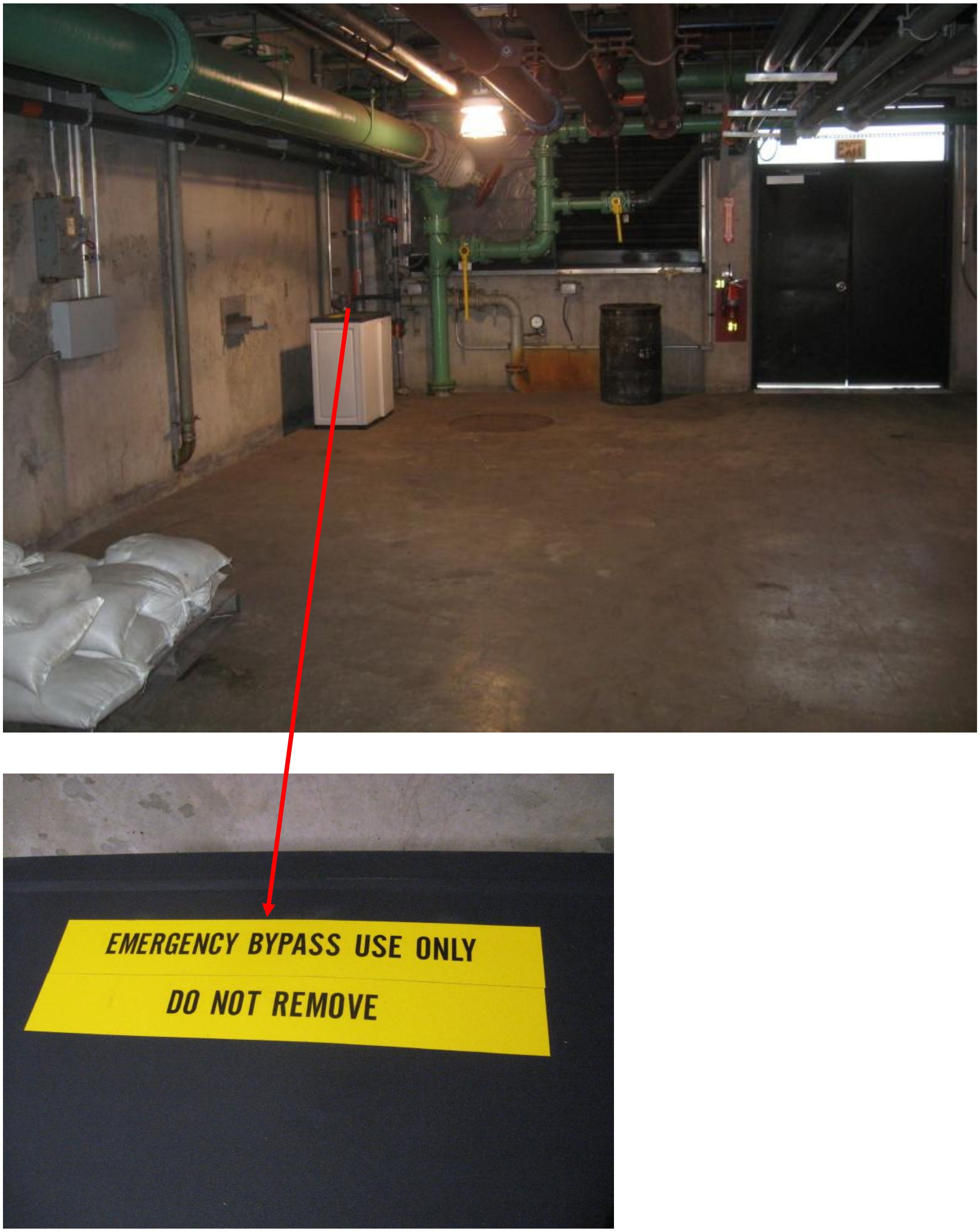


Figure 2 Location of Emergency Hypo Hose

Figure 3 Junction # 4 Location

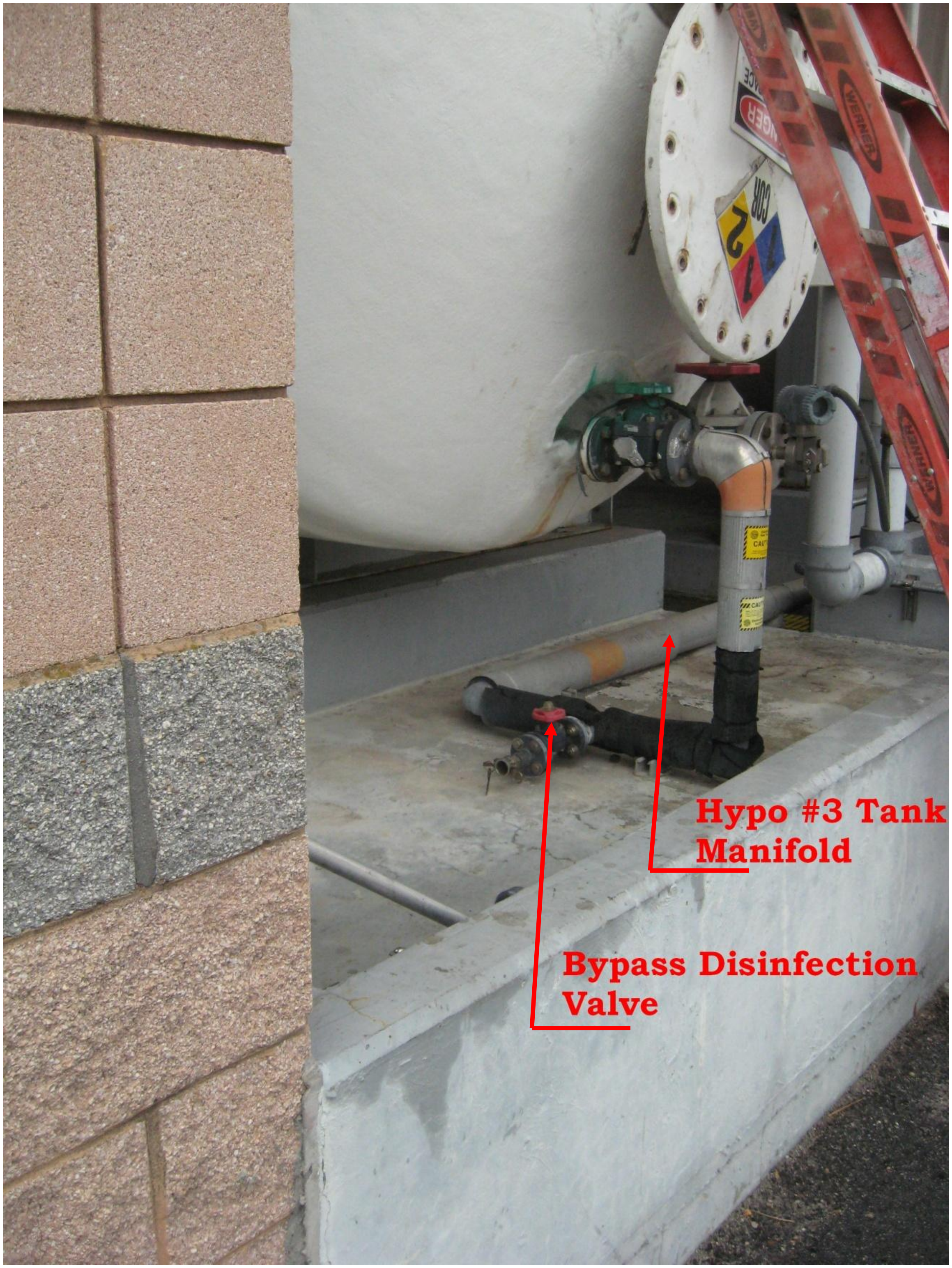


Figure 4 Hypo Connection

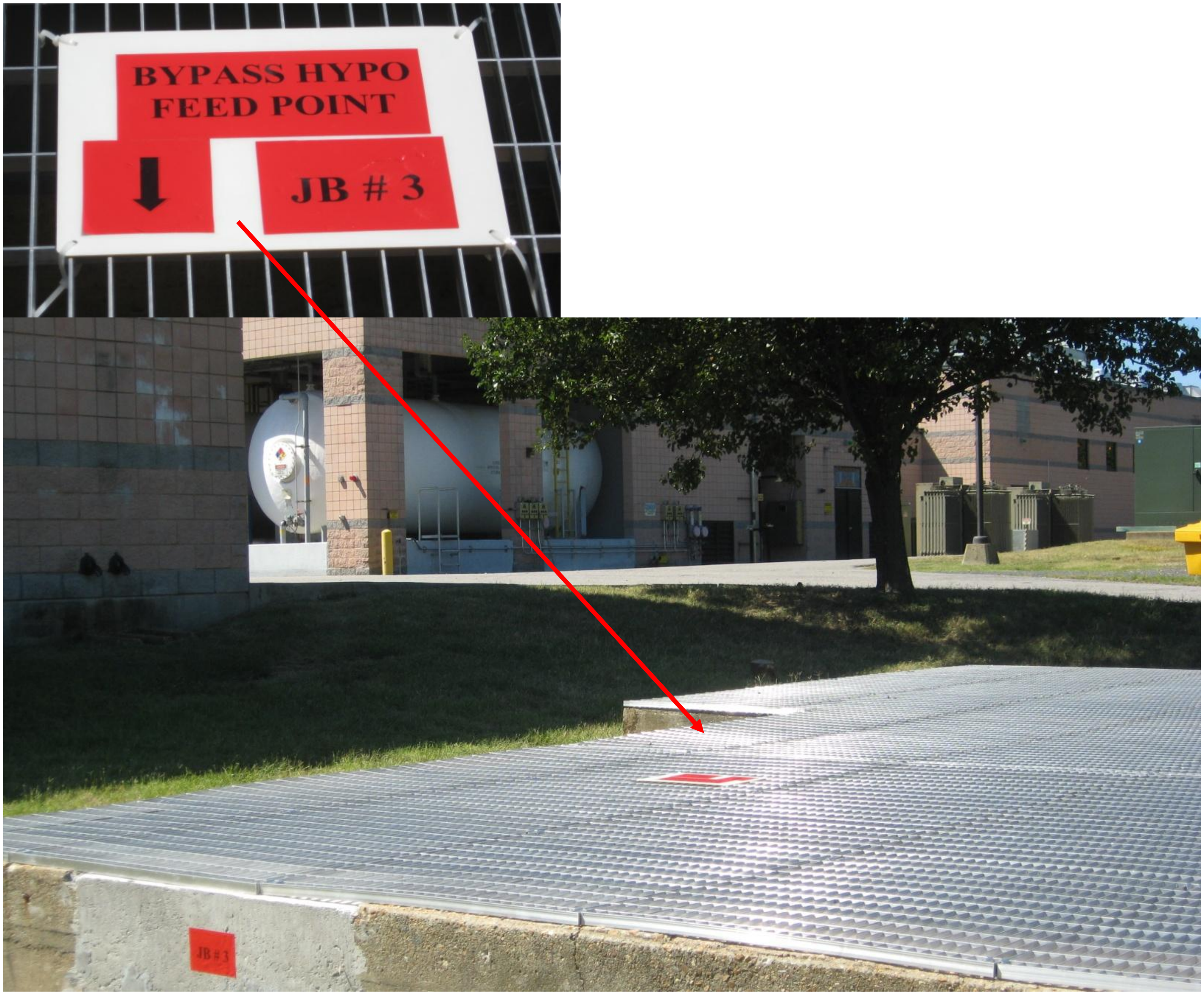


Figure 5 Hypo Feed Location at JB # 3 updated the figure

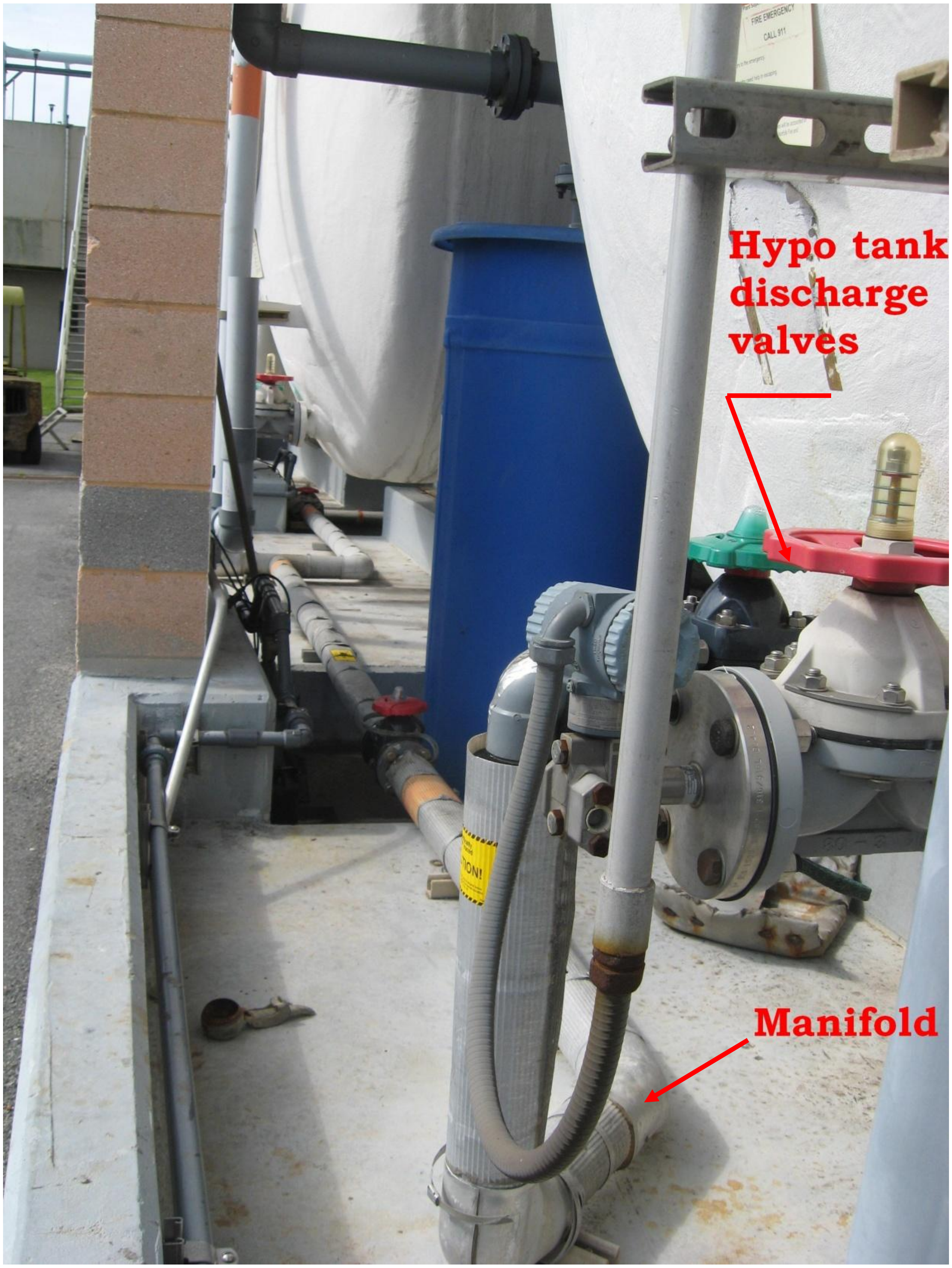


Figure 6 Hypo Feed System

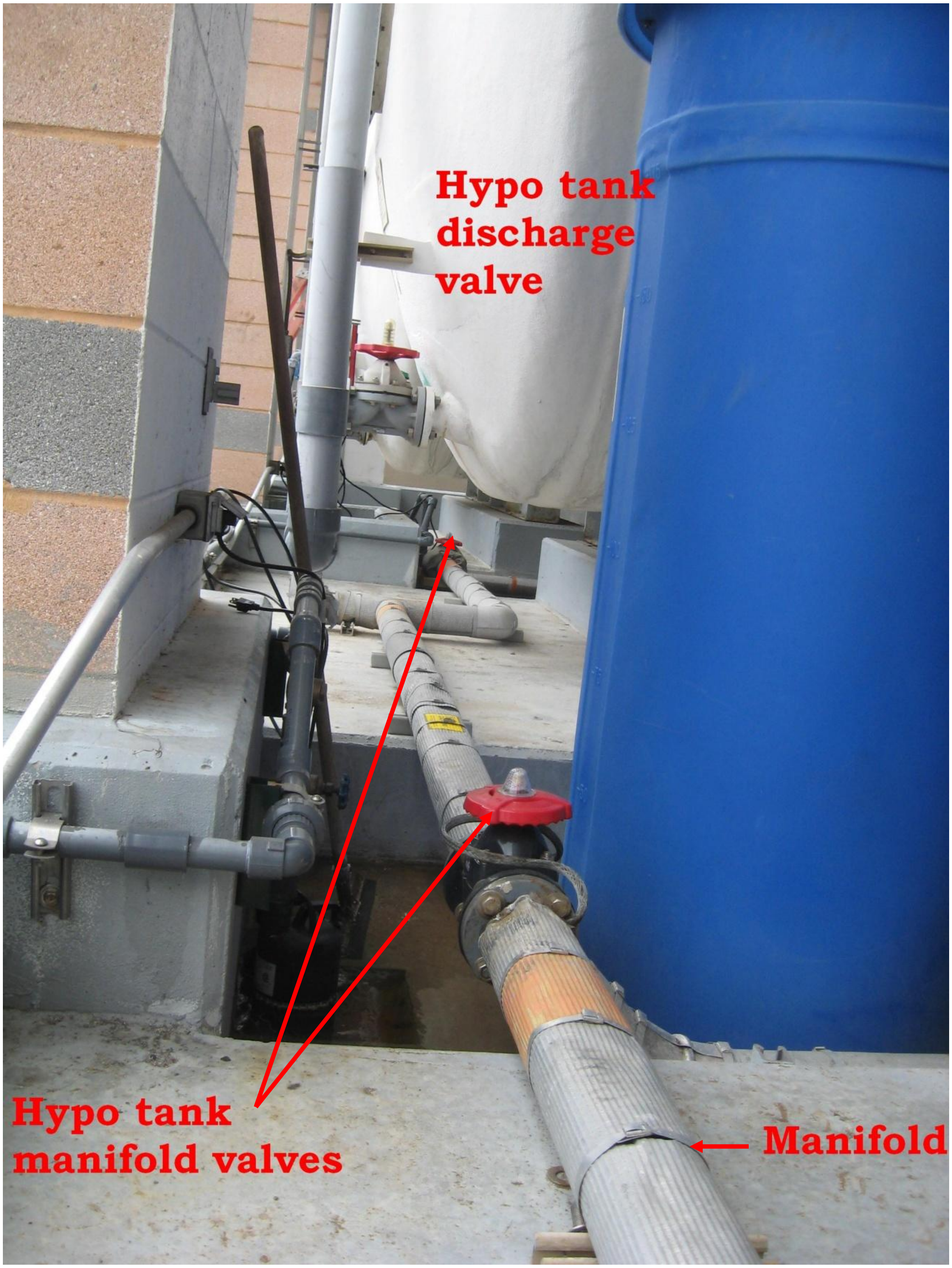
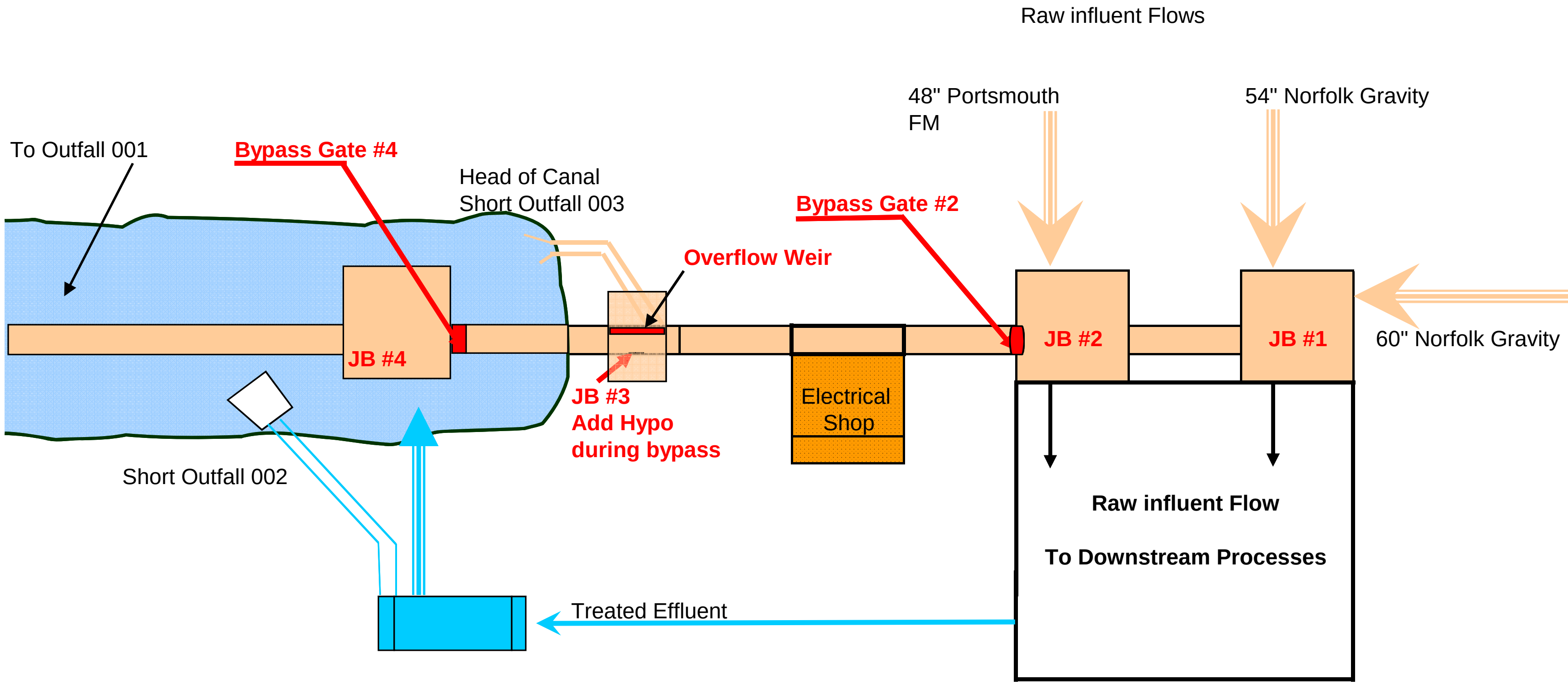


Figure 7 Hypo Feed System

Figure 8 Bypass Gate #2 at JB # 2

Figure 9 Bypass Gate # 4 at JB #4

VIP BYPASS FLOW DIAGRAM



APPENDIX B: COMPREHENSIVE PHONE DIRECTORY

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OPERATIONS DIVISION TELEPHONE LIST

Name	Title	Contact Information	
David Waltrip	Director of Operations	Office	757-460-4223
Brian McNamara	Army Base Treatment Plant Manager	Office	757-440-2521
Erwin Bonatz	Atlantic Treatment Plant Manager	Office	757-821-7402
Christel Dyer	Boat Harbor Treatment Plant Manager	Office	757-244-1671
Jeffrey Lane	Chesapeake-Elizabeth Treatment Plant Manager	Office	757-318-3601
Bob Rutherford	James River Treatment Plant Manager	Office	757-833-1741
Bill Balzer	Nansemond Treatment Plant Manager	Office	757-638-7361
Sami Ghosn	VIP Treatment Plant Manager	Office	757-440-2501
Mike Parsons	Williamsburg Treatment Plant Manager	Office	757-258-6441
Andy Nelson	York River Treatment Plant Manager	Office	757-833-1770

INTERCEPTOR SYSTEMS TELEPHONE LIST

Name	Title	Contact Information	
Karen Harr	Chief of South Shore Interceptors	Office Cell Phone	757-360-4211 757-374-9238
Chris Stephan	Chief of North Shore Interceptors	Office Cell Phone	757-833-1739 757-777-7511
Jay Bernas	Chief of Planning and Analysis	Office Cell Phone	757-318-4335 757-374-9236
Sam McAdoo	Systems Manager, South Shore	Office Cell Phone	757-460-7093 757-284-7222
Gene Rutledge	Interceptor Engineer, South Shore	Office Cell Phone	757-318-4338 757-284-7222
Coleen Wells	Interceptor Engineer, South Shore	Office Cell Phone	757-355-5020 757-605-8171
Ryan Brewster	Interceptor Engineer, North Shore	Office Cell Phone	757-833-1729 757-284-5771
Jeff Sparks	Interceptor Engineer, North Shore	Office Cell Phone	757-833-1719 757-353-9568

NORTH SHORE INTERCEPTORS TELEPHONE LIST

Name	Title	Contact Information	
Eric Jackson	Superintendent Interceptor	Office Cell phone	833-1724 613-6597
Stan Saunders	Pump Station Supervisor	Office Cell phone	833-1725 613-6598
Kenny Pierce	System Supervisor	Office Cell phone	833-1726 613-6599
	Duty Supervisor	Office	613-6600
	Operations Coordinator	Office	833-1720

SOUTH SHORE INTERCEPTORS TELEPHONE LIST

Name	Title	Contact Information	
John Wade	Superintendent	Office Cell phone	460-7070 284-8101
Mike Mundy	Superintendent Interceptors	Office Cell phone	460-7077 284-8102
Ron Corby	Superintendent Collections	Office Cell phone	460-7071 284-8103
	Duty Supervisor	Office	284-8118
	Operations Coordinator	Office	460-7072

NORTH SHORE LOCALITIES EMERGENCY TELEPHONE LIST

LOCALITY	OFFICE	CELL	OTHER
YORK COUNTY			
ON CALL (PS & F/M)		876-8807	
ON CALL (GRAVITY LINES)		876-8817	
Gene Aston (Ops Sup)	890-3797	876-8806	
Daryl Ballard (GRAVITY LINES)	890-3895	876-8815	
Brian Woodward (CHIEF OF UTILITIES)	890-3241	592-6776	
EMERGENCY DISPATCH	890-3603		
WORK HOUR DISPATCH	890-3752		
GLOUCESTER COUNTY			
Arnie Francis (Util. Supv.)	804-693-1230	804-815-1618	
AFTER HOURS DISPATCH (SHERIFF)	804-693-3890		
CITY OF POQUOSON			
Bob Speechley (SUPERVISOR)	868-3594	876-0463	872-1432
Mike Snapp	868-3505	812-5381	872-1894
Public Works	868-3590		
AFTER HOURS DISPATCH (POLICE)	868-3501		
CITY OF NEWPORT NEWS			
Steve Land (Administrator)	269-2751	592-7352	
Allen Benthall (Asst. Administrator)	269-2753		
David Finch (Ops Supt.)	269-2766	592-7353	
Andy Belvin (PS Ops Supv.)	269-2768	592-3966	
Wastewater Dispatch	269-2750		
ON CALL CELL PHONE		592-2771	
AFTER HOURS	269-2700		

LOCALITY	OFFICE	CELL	OTHER
CITY OF HAMPTON			
Jason Mitchell (Ops Manager)	726-2950	876-2120	
Donnel Gray (Construction Manager)	726-2901	810-9330	
Barry Dobbins (I & I Manager)	726-2944	810-4397	
Jerry Surrett	876-7709		
ON CALL PS MECHANIC		810-4502	931-0220
COLLEGE OF WILLIAM & MARY			
Facilities Management Office	757-221-2270		
EMERGENCY & AFTER HOURS - CAMPUS POLICE	757-221-4596		
VIMS GLOUCESTER			
Mike Kershner (ENGINEER)	804-684-7013	804-642-7912	757-877-0409
EMERGENCY / AFTER HOURS (Security)		804-694-7300	
CITY OF WILLIAMSBURG			
Paul Reiser (SUPERVISOR)	757-220-6233	757-846-8531	757-897-3256
John Stevens (LOCATOR)	757-220-6233	757-870-3167	757-810-7716
Bobby Warner (PS SUPVR)	757-220-6232	757-814-1405	757-882-0324
Emergency Number	757-220-6196		
JAMES CITY SERVICE AUTHORITY			
George Adams (OPERATIONS)	757-259-4100	757-592-0081	
Bill Harris (PS SUPV.)	757-259-4095	757-592-6785	
Danny Poe	757-253-6810	757-592-2321	
Tom Ebert (Underground)	757-259-4097	757-592-6791	
DISPATCH (DAY)	757-229-7421		
DISPATCH (NIGHT)	757-566-0112		
LANGLEY AFB			
Carmicheal Patton - Manager Erosion Environment	764-3987/1046	846-3688	
Ashley Timmreck - Water Program Manager	764-1130		
Service Call	764-5342 / 5343		
Emergency - Fire Station	764-4222		
Mr. Franken (Waste Water Foreman)	757-764-2877 / 764-6168		
NAVAL WEAPONS STATIONS			
Public Works Dept. (Dispatch)	445-6868		
James Michener-Water/Sewer Eng	887-4291	636-4084	

LOCALITY	OFFICE	CELL	OTHER
FORT EUSTIS			
Susan Miller	878-4123 Ext 302	757-880-6749	
AFTER HOURS EMERGENCY	878-4357		
CAMP PEARY			
Jennifer Davis (Environmental Manager)	757-229-2121 Ext 4263		
Scott Florence (Public Works Dept.)	757-229-2121 Ext 2200		
AFTER HOURS	757-229-2121		
CHEATHAM ANNEX			
Public Works Duty Desk	757-887-7373		
YORK RIVER COAST GUARD BASE			
TBD - Hiring (Facilities Engineering)	856-2215		
OFFICER OF THE DAY (24 hrs.)	856-2354		
BASE SECURITY (24 hrs.)	856-2314		
VIRGINIA POWER			
FORT EUSTIS	878-5225		
VERIZON			
DISPATCH (LOW WIRES, POLES)	757-875-2710		
VERIZON UTILITIES (Bob Huffman)	757-810-1595	757-810-9051	
ANHEUSER BUSCH INC.			
Jeff Osterloh (Resident Eng)	253-3691		
BUSCH GARDENS			
Greg Thacker (Maintenance)	757-253-3406	757-897-6387	
Larry Vaughn	757-253-3426	757-897-3426	
John Vaughn (Utilities)	757-253-3429	757-897-6388	
Patrick Henry Market Shopping Center			
Main Office	249-2338		
Security	249-9107	810-6201	
GREAT WOLF LODGE			
Tom Nealey - Operations Supervisor	757-229-9700	757-784-0647	

SOUTH SHORE LOCALITIES EMERGENCY TELEPHONE LIST

Locality	Phone	Hours/Comments
Miss Utility		
Chesapeake	382-6352	normal working hours 8:30 a.m. through 5 p.m.
Norfolk	823-1000	normal working hours 7 a.m. through 3:30 p.m.
Portsmouth	393-8561	normal working hours 7:30 a.m. through 4 p.m.
Suffolk	514-7000	normal working hours 8:30 a.m. through 5 p.m.
Virginia Beach	385-1409	normal working hours 7 a.m. through 5 p.m.
Permits		
Chesapeake	382-6018	normal working hours 8:30 a.m. through 5 p.m.
Norfolk	664-6565	normal working hours 7 a.m. through 3:30 p.m.
Portsmouth	393-8531	normal working hours 7:30 a.m. through 4 p.m.
Suffolk	514-4150	normal working hours 8:30 a.m. through 5 p.m.
Virginia Beach	385-4211	normal working hours 7 a.m. through 5 p.m.
Public Utilities - Sewer/Water		
Chesapeake	382-3400	normal working hours 8:30 a.m. through 5 p.m. after hours 382-3550
Norfolk	823-1000	normal working hours 7 a.m. through 3:30 p.m. 24 hour #
Portsmouth	393-8561	normal working hours 7:30 a.m. through 4 p.m. 24 hour #
Suffolk	514-7000	normal working hours 8:30 a.m. through 5 p.m. after hours 514-7034
Virginia Beach	385-4631	normal working hours 7 a.m. through 5 p.m. 24 hour #
Traffic		
Chesapeake	382-6177	normal working hours 8:30 a.m. through 5 p.m.
Norfolk	441-5818	normal working hours 7 a.m. through 3:30 p.m.
Portsmouth	393-8594	normal working hours 7:30 a.m. through 4 p.m.
Suffolk	925-1654	normal working hours 8:30 a.m. through 5 p.m./ Signals 238-2834, Signs 925-2665
Virginia Beach	385-1409	normal working hours 7 a.m. through 5 p.m.
Miscellaneous Numbers		
Little Creek Amp Base		cell 462-7071, pager 682-6787
Dominion Virginia Power		866-591-0157 - remember to give station acct # when reporting power outage
Colonial Pipeline		800-926-2728
Columbia Gas		800-835-7191, 800-543-8911
Virginia Natural Gas		466-5500
Cox Communications		224-1111, MU 222-6566, Evenings/Weekends 222-3530

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APPENDIX C: NORFOLK-HRSD INTERIM OPERATING PLAN

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NORFOLK – HAMPTON ROADS SANITATION DISTRICT
Interim Operating Plan
Norfolk Sewer Pumping Stations # 18, 23, 51, 52, & 57
January 12, 2005

I. Planning Measures

HRSD and Norfolk operating personnel will meet on a regular basis to discuss the operation of both the Norfolk and HRSD systems during wet weather conditions and strategies to minimize overflows during the interim period until completion of the projects associated with Norfolk pumping stations 18, 23, 51, 52, and 57 as referenced in the 2005 consent special order among the Virginia Department of Environmental Quality, HRSD and Norfolk.

II. Operational Measures

A. In the case of a forecasted event that could result in overflows occurring in the sewersheds served by Norfolk Pumping Stations 18, 23, 51, 52, and 57 and/or the HRSD interceptor system components connected to such sewersheds (altogether, the "Locations"), HRSD and Norfolk will seek to contact each other in advance of such events to ensure that appropriate staffing and any needed equipment or supplies are available to take operational measures to minimize, prevent or control overflows under the circumstances.

B. In the case of an unforecasted event or an event that is more severe than expected, each party will seek to contact the other to assess what measures, if needed, should be taken to minimize, prevent, or control overflows at the Locations under the circumstances.

C.. When events are forecasted or in response to events that are occurring that could result in overflows occurring at any of the Locations, Norfolk and HRSD will implement operational precautions and measures based on good sewer system operation practices and protection of human health and the environment to minimize, prevent, or control overflows. This may include, but is not limited to, adjustments to flows or pressures in the affected sewer lines or components of either Norfolk's system or HRSD's system, or both, as the parties may agree at the time given the circumstances.

D. Norfolk and HRSD will monitor the performance of the affected parts of their systems and maintain regular communications to ensure that operational measures are being employed satisfactorily and to adjust to changing conditions as needed.

E. Once the storm or precipitating event has subsided, the parties will continue to monitor the Locations and the threat of overflows due to any delayed effects until both parties agree that such threat has also subsided.

F. Should any overflows occur despite the operational measures contemplated herein, the parties will timely report such overflows to the regulatory authorities and will take appropriate actions necessary to cleanup of the overflow.

G. Norfolk and HRSD will maintain records of contacts and actions taken pursuant to this Interim Plan and confer to correlate same as needed.

H. The parties will review the actions taken and determine if and how better approaches could be employed to minimize, prevent, or control overflows under the circumstances and seek to incorporate any identified improvements to such actions in future events as appropriate.

I. Norfolk and HRSD will provide weekly updates of their standby duty contacts for each others use in addition to the contact information listed in Section III.

J. In an effort to work cooperatively with Norfolk during wet weather, HRSD has implemented a number of operational practices intended to minimize sanitary sewer overflows to the maximum extent practicable. These operational practices include the following kinds of activities:

- HRSD notifies Norfolk, including through automatic alarms that page Norfolk operational staff, when HRSD pump stations experience high wet well levels.
- HRSD makes available numerous portable pumps of varying sizes. Some of the larger pumps are semi-permanently located in key points in the system. Other pumps are moved around the system in advance of major storms to serve Norfolk.
- HRSD runs its stand-by pumps whenever necessary to minimize or prevent an overflow in or from the Norfolk system.
- HRSD has provided back-up power or connections for emergency generators to maximize the operation of its key pump stations serving the City during power outages.
- HRSD has diverted flow on an interim basis from its VIP Plant to HRSD's Chesapeake-Elizabeth plant in order to create additional wet weather capacity for Norfolk flows.

III. Contact Information

A. Norfolk contact information:

Eric Tucker
Utility Operations Manager

Telephone:	757-823-1005
Fax:	757-823-1075
Pager:	757-554-5293
Cell:	757-328-1765

B. HRSD contact information

Troy McPherson
Chief of Interceptor Operations

Telephone:	757-460-7078
Fax:	757-460-9149
Cell:	757-434-0524

NORFOLK – HAMPTON ROADS SANITATION DISTRICT
Interim Operating Plan
Norfolk Sewer Pumping Stations # 18, 23, 51, 52, & 57
January 12, 2005

Kenneth Taylor
Asst. Superintendent of Wastewater

Telephone:	757-823-1025
Fax:	757-823-1074
Pager:	757-554-5254
Cell:	757-650-2748

Rodney Talley
Gen. Utility Maint. Supervisor – Pump Stations

Telephone:	757-823-1023
Fax:	757-823-1074
Pager:	757-554-5253
Cell:	757-635-7928

Carey Canty
Sr. Utility Maint. Supervisor – Pump Stations

Telephone:	757-823-1028
Fax:	757-823-1074
Pager:	757-554-5220
Cell:	757-650-0484

John Wade
Interceptor Superintendent

Telephone:	757-460-7070
Fax:	757-460-9149
Pager:	757-307-0623
Cell:	757-434-5920

Mike Mundy
Chief Foreman

Cell: 757-434-5921

Ron Corby
Pump Stations

Cell: 757-434-5919

Gary Soule
Interceptor System Supervisor

Cell: 757-439-0941